

# **Perceiving and Remembering Social Groups: Ingroup Projection, Goal Types, and Memory Distortions**

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## General Introduction and Overview of the Present Research

In general, people favour social groups they belong to (ingroups) and treat other groups (outgroups) less positively. By now, several lines of research have attempted to examine such phenomena and the associated underlying processes. Most research, however, focused predominantly on ingroup favouritism, whereas explicitly negative treatment of the outgroup has received much less attention. Brewer (1999) suggests considering ‘ingroup love’ and ‘outgroup hate’ as two separate, though possibly related phenomena and processes.

One prominent approach to explain the conditions and determinants of differential intergroup judgment is the Ingroup Projection Model (Mummendey & Wenzel, 1999). In short, the model proposes that group comparisons take place with reference to an inclusive superordinate category and that, under certain conditions, ingroup features are transferred (i.e., projected) onto the superordinate group, which makes the ingroup relatively more prototypical for the superordinate category compared to the outgroup. Following self categorisation theory (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987), the closer subgroups get to the prototype of the inclusive group, the more positive they are perceived. Thus, perceiving one's ingroup as relatively more prototypical for an inclusive category than an outgroup, legitimises ingroup bias i.e. to evaluate and treat outgroup members less positively or more negatively than ingroup members (Turner et al., 1987).

The present research aims to extend the Ingroup Projection Model (IPM) by proposing that ingroup projection differs in accordance with specific ingroup features. It is suggested that specific features emphasize different degrees of the perceived relative ingroup prototypicality, which consequently affects the judgment and behaviour towards outgroups. Derived from Brendl and Higgins (1996), we distinguish these specific ingroup features as two kinds of goals that are defined by a different structure. The relevant goal types were *minimal goals*, implying an either-or evaluation, and *maximal goals*, which imply graded evaluations. Brendl and Higgins (1996) introduced these two goal types in order to predict how individuals' perception of valence emerges. In particular, they suggest that deviations from a gradually structured maximal goal would lead to more or less positive evaluations depending on the distance to the goal. However, in case of a dichotomously structured minimal goal any deviation from this goal should be perceived as a violation and as unacceptable. Following this, we expect that minimal goals are exceedingly important for the viability and stability of groups. Moreover, especially in terms of one's own group, minimal

ingroup goals are expected to be perceived as particularly prototypical, which consequentially influences the attitudes towards the outgroup. Chapter I of this dissertation examines this proposition.

In order to further the understanding of intergroup judgement it is important to investigate their basic underlying cognitive processes. However, despite the extensive literature and research on ingroup favouritism and social discrimination, there seems to be a lack of research that directly knits together the very basic psychological principles and the more “explicit” intergroup phenomena. We are convinced that the different approaches should be brought together in order to provide more outright explanations for the phenomena and to yield more valid confirmations of the proposed models. Aside from the above proposed extension of the IPM by considering the projection of different ingroup features, this conclusion was the other crucial origin of the present thesis. In particular, the aim of the present work was to acquire empirical evidence for the IPM by means of a paradigm developed on the basis of previous research on social information processing and memory. Taking into account that ingroup projection is per definition a process, we chose this approach, because the consideration of individuals’ memory provides the opportunity to examine ingroup projection on-line. The investigation of the dynamic nature of ingroup projection has — by now — received no attention but is definitely necessary in order to yield an appropriate confirmation of the IPM.

It is proposed that ingroup projection can be considered as a cognitive schema having an impact on memory. Specifically, we predict that ingroup projection affects the recall and recognition of previously presented group information. The examination of the memory hypotheses will be the major constituent of Chapter II. In order to provide generalizable evidence for the process of ingroup projection, the present thesis includes the investigation of different cognitive and motivational aspects that were expected to influence the process of ingroup projection leading to different memory effects. Besides, the proposed memory effects were examined by considering different intergroup contexts, different modalities of information presentation and two different measure time points.

In Chapter III, the research of the two former Chapters will be tied together. This final Chapter addresses the applicability of the memory approach introduced in Chapter II on the findings of Chapter I regarding the projection of different ingroup goal types (i.e. minimal vs. maximal goals). Theoretical and methodological aspects of the previous two Chapters will be



shortly reviewed and results will be presented and discussed. Finally, concluding remarks are made and implications for further research will be outlined.

To summarize, the dissertation examines conditions and processes leading to social discrimination between groups. The current work encompasses three chapters and is structured as follows. After this general introductory part, the first part of our work presented in Chapter I elaborates the impact of minimal goals and maximal goals on ingroup projection. A very short but critical consideration of the findings reported in Chapter I, taking into account the findings from previous research on ingroup projection constitutes the starting point for the following Chapter.

Chapter II provides the presentation and discussion of our research on the influence of ingroup projection on memory. Finally, in Chapter III the findings of Chapter I and II are integrated by an examination of the findings regarding minimal and maximal goals reported in Chapter I on the basis of the memory approach presented in Chapter II.

All three Chapters comprise an introductory, theoretical part, which contains a short review and discussion of previous findings regarding the particular topic. After the respective introduction, each chapter provides an outline of the respective methodological approach and the presentation of the empirical findings, which are summarized and discussed.

## Chapter I

### The Projection of Minimal and Maximal Goals

*“You have your way. I have my way.  
As for the right way, the correct way, and the only way  
it does not exist.”*

Friedrich Nietzsche (1844 – 1900)

#### I. 1. Introduction

Social discrimination between groups still is an important issue in today's societies. The unequal treatment of members from different groups is a conspicuous phenomenon in several areas ranging from more subtle forms of discrimination (e.g., ignorance towards specific needs of others) to overt aggression between social groups (e.g., wars for scarce resources between countries). The everlasting relevance of this topic is also reflected in social-psychological research. Theoretical claims range over the spectrum from mild ingroup favouritism to severe discrimination, devaluation and hostility against outgroups (see Brewer & Brown, 1998, for an overview). Empirical evidence however, mostly focused on ingroup favouritism, whereas explicitly negative treatment of the outgroup (OG) has received less attention. Brewer (1999) identified this inconsistency, and argued for theoretically differentiating 'ingroup love' and 'outgroup hate' as two separate, though possibly related phenomena and processes (see also Mummendey & Otten, 1998).

Based on Social Identity Theory (Tajfel & Turner, 1979) and Self-categorization Theory (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987), Mummendey and Wenzel (1999) proposed the Ingroup Projection Model (IPM) as a more general analysis of antecedents and processes underlying the way of dealing with intergroup difference. Its central assumption is that groups evaluate themselves and others with reference to a common superordinate group, which provides relevant comparison dimensions. Group members, especially when highly identified on both the subordinate and superordinate level, are expected to perceive a congruency among the group attributes on both levels. Moreover, perceiving a subgroup to be more close to the superordinate group (SOG) implies a more positive evaluation, provided that the relevant SOG is positively evaluated. Following this, the closer the ingroup (IG) is considered to be to the prototype of the SOG, the more positive its evaluation. Thus, by projecting their IG's characteristics onto the superordinate ingroup, group members gain a

superordinate ingroup which confers more prototypicality to the IG relative to the OG. As a consequence, the OG is perceived as less prototypical and therefore deserves less positive evaluation and treatment.

It has been shown in previous research that IG attributes are indeed perceived as being more relatively prototypical (e.g. Waldzus, Mummendey, Wenzel, & Böttcher, 2004; Waldzus, Mummendey, Wenzel, & Weber, 2003; Waldzus & Mummendey, 2004; Waldzus, Mummendey, & Wenzel, 2005; Wenzel, Mummendey, Weber, & Waldzus, 2003). Moreover, previous studies on ingroup projection confirm that there is a strong connection between the relative prototypicality of the IG and attitudes towards a respective OG (e.g. Waldzus et al., 2003; Waldzus & Mummendey, 2004; Waldzus et al., 2005; Wenzel et al., 2003; Weber, Mummendey, & Waldzus, 2002; for a recent review see Wenzel, Mummendey, & Waldzus, 2007). Thus, the representations of IG and OG with reference to a relevant SOG apparently play an essential role for the evaluation of groups. However, by now, research on ingroup projection and OG evaluation focussed mainly on a more general evaluation of OGs and did not distinguish between just less positive OG evaluations and explicit negative OG attitudes.

Even though previous research has predominantly focussed on ingroup attributes, it is also quite coherent to expect that other features from the IG, as for example IG goals, are projected onto the SOG. However, a remaining question is — also regarding determinants for a distinction between explicit negative and just less positive OG evaluations — whether all features of the IG are projected in the same way or whether specific features of the IG involve different degrees of ingroup projection. It is possible that specific IG features are crucial for the viability of the group and therefore perceived as particularly prototypical, whereas other IG features might be considered as less important and might not necessarily be projected completely onto the SOG. If it is indeed the case that different IG features entail different degrees of ingroup projection, then this would also affect the attitudes towards the OG, because the OG is evaluated on the basis of relative prototypicality. Thus, if a specific IG feature is perceived as particularly prototypical for the SOG the attitudes towards the OG might be explicitly negative. Conversely, a rather unessential IG feature would only be considered as somewhat prototypical and therefore might entail only a less positive evaluation of the OG. Following this, the precise investigation of determinants of ingroup projection is especially relevant with regard to the evaluation and treatment of OGs, because the Ingroup Projection Model in its present form neither differentially conceptualizes nor predicts less positive versus explicitly negative evaluations or treatments of OGs. The present research aims at resolving this issue.

### ***I. 1.1. Ingroup Projection and Ingroup Goal Types***

Searching for predictors of explicitly negative treatment (e.g. social exclusion) Mummendey, Waldzus and Kessler (2002) considered different types of goals — from which one can deviate — that could be used to differentiate between an explicitly negative treatment from just less positive treatment. Following Brendl and Higgins (1996), they distinguished between maximal and minimal goals. In the case of *maximal goals*, evaluations are *graded, dependent upon* the distance to the reference point (i.e., goal), ranging from less positive to more positive evaluations. By contrast, *minimal goals* imply *absolute evaluations* structured in an either-or fashion. That is, any behaviour which meets the minimal goal is acceptable, any which does not meet it is not; irrespective of its degree, any deviation is negative. Several recent studies corroborated this distinction of minimal and maximal goals and yielded empirical evidence about the expected effects in terms of evaluative and behavioural responses to goal violations. (Kessler, Neumann, Mummendey, Berthold, Schubert, & Waldzus, 2008; Fritsche, Kessler, Mummendey, & Neumann, 2008; Schubert, Mummendey, Waldzus, & Kessler, 2008). In fact, Kessler et al. (2008) recently showed in several studies that the assignment of punishment and social exclusion differed according to the goal type: A deviation from a minimal standard/goal was followed by harsher reactions compared to a deviation from a maximal standard/goal.

Although so far, these findings apply to negative sanctions of individual deviations from consensual group goals, one could expect the evaluative and behavioural treatment of groups to be based on reference to maximal and minimal goals, too. The perception of a group deviating from a minimal goal is expected to result in severe punishment and perhaps social exclusion of that group from the common SOG. Given the relevance of the representation of own and other groups in terms of goals for the evaluative and behavioural treatment of own and other groups, it is important to analyze which factors might affect this representation. Following this question, the present research extends the assumptions of the ingroup projection model in line with the findings outlined above. It is investigated whether or not IG goals are also projected onto the SOG, and more specifically, whether ingroup projection differs depending on the type of goal. Since studies have shown that minimal goals serve as particularly important reference points, it is plausible to expect that group members perceiving their IG to have a minimal goal are likely to assume that the respective goal is also pursued by the SOG. We refer to this hypothesis as *Goal Type Hypothesis*.

Minimal goals of the IG are supposed to be projected onto the SOG for two reasons. First, minimal goals are capable of keeping definite standards. The structure of a minimal goal offers a clear-cut guideline for what is expected, which is essential in defining the borders of a category. Therefore, by means of these goals, a particular standard within the IG can be maintained which is essential for the continuity of the group. Second, since minimal goals are of particular interest for the IG, it is assumed that such specific prescriptive group features provide important criteria for group comparisons and evaluations. Since groups are evaluated with regard to an inclusive SOG, a representation of the SOG containing the same minimal goals as those of the IG seems to be quite essential for maintaining the particular standard. Also, the assumption that the IG standard is relatively prototypical provides IG members with the legitimization of deciding whether another group is included in the SOG or not. To summarize, what has to be tested is the hypothesis that the goal type is supposed to have an important influence on ingroup projection. The *Goal Type Hypothesis* implies testing of two sub hypotheses. It is expected primarily that the goal type has an influence on the projection of the goal position of the IG onto the SOG. Secondly, this process should be simultaneously accompanied by the projection of the goal type. Thus, in case of a minimal goal, relative ingroup prototypicality (RIP) is expected to be particular high, and the SOG should also be perceived as having a minimal goal, due to the fact that the IG goal type is projected onto the SOG and therefore the goal types of IG and SOG are supposed to match.

Additionally, in line with assumptions of the ingroup projection model and corresponding empirical evidence (e.g. Waldzus et al., 2004; Wenzel et al., 2003), we assume a *perspective divergence* between different subgroups. That is, members of two subgroups are expected to disagree on their perception of respective relative ingroup prototypicality in terms of their representation of the goals of the SOG.

### ***I. 1.2. Relative Ingroup Prototypicality (RIP) & Attitudes towards the Outgroup***

There is strong evidence for the robust relationship between relative ingroup prototypicality (RIP) and evaluative and behavioural treatments in intergroup relations (see Wenzel et al., 2007 for a review). It is now necessary to further examine whether the relation of RIP and attitudes towards the OG is also valid for RIP with respect to IG goals; especially by taking into account the two different goal types. Moreover, whilst previous studies considered rather mild forms of OG derogation (i.e. the less positive evaluation of OGs) the present research is focussing on more explicit negative evaluations and treatments of the OG. Additionally, — taking the assumptions referring to the goal type into account — questions

regarding OG exclusion become relevant. Therefore, the present research includes the evaluation of OG's membership in the SOG within the measurement of attitudes towards the OG, assuming that this extension will provide a broader understanding of intergroup relations and conflicts.

Taken together, a conjunction of ingroup projection and group goals, including the distinction of minimal and maximal goals appears to be a promising extension of the Ingroup Projection Model. Aside to the hypothesis that ingroup projection occurs in terms of IG goals, it is assumed that projection differs according to the goal type. IG goals represented as minimal goals should be perceived as especially prototypical for the SOG compared to maximal goals. Thus, in terms of empirical evidence, RIP is expected to be higher in the case of a minimal goal compared to a maximal goal. Furthermore, and in line with previous studies, we assume that there is a strong relation between RIP and the attitudes towards OGs.

## **I. 2. Overview of the Research presented in Chapter I**

The purpose of the present research was the examination of the projection of group goals onto the SOG; in particular by considering the two different types of goals. Four studies were conducted to test our two central predictions. Study I.1 and 2 used a quasi-experimental design, whereas Study I.3 and 4 tested the hypotheses on behalf of an experimental design. Presupposing that ingroup projection is also valid for IG goals, the first aim of this research was to explore whether ingroup projection differs depending on the type of the IG goal (*Goal Type Hypothesis*). In case of minimal IG goals, projection was expected to result in higher RIP compared to maximal IG goals. Additionally, the goal types of IG and SOG were supposed to match, because the IG goal type should be projected onto the SOG goal type. However, basing on the results of Study I.1, the first assumption of the goal type hypothesis was slightly modified for the subsequent studies; the highest RIP was predicted when both IG and SOG were perceived as having a minimal goal (due to the projection of the IG goal type onto the SOG goal type). As a second major interest, we analyzed whether RIP with regard to goal projection is related to attitudes towards the OG (*Relative Ingroup Prototypicality & Attitudes towards the Outgroup Hypothesis*).

In Study I.1, the hypotheses were tested by means of an intergroup design with two different IGs. Goal positions of IG, OG and the SOG towards one specific goal and the associated goal type (i.e., minimal or maximal goal) were assessed quasi-experimentally. Participants were also asked questions concerning their attitudes towards the relevant OG. Study I.2 tested the same hypotheses, applying a different intergroup context. Furthermore, ingroup projection was considered for the *actual* representation of the SOG on the one hand, and the *ideal* SOG representation on the other. We expected ingroup projection particularly to emerge in the case of the *ideal* SOG, because this kind of representation offers a certain freedom to project since there are fewer constraints. Thus, one might claim that RIP regarding the *ideal* SOG might display the motivation or wish to project.

The aim of Studies I.3 and 4 was to replicate the findings from the first two studies by establishing an experimental design with the ‘goal type representation’ being manipulated.

### **I. 3.1. Study I.1 – The Perception of Christian Values**

The first aim of Study I.1 was to test whether ingroup projection varies in accordance with the IG goal type. It was assumed that IG goals when represented as minimal goals would inspire more ingroup projection, and therefore result in a higher RIP compared to goals that are represented as maximal goals. Moreover, since the projection of IG goals is hypothesized

to apply for the goal position as well as the goal type, we also expected a congruence between the goal type representations of IG and SOG. However, in order to replicate the findings of previous research on the IPM a preliminary analysis was conducted to ensure that ingroup projection actually occurs and produces a perspective divergence between the investigated two subgroups. In particular each subgroup was expected to perceive its goal position as being more relatively prototypical.

As the second interest, we considered whether RIP is related to the attitudes towards the OG. More specifically, we expected the evaluation of, and the behavioural intentions towards the OG would be less positive, the more the IG goal was perceived to be relatively prototypical.

We conducted a questionnaire study, including a specific goal and questions concerning the goal positions of IG, OG and the SOG. The chosen intergroup context involved Catholic vs. Evangelic Christians within the SOG labelled “Real” Christians. In terms of the goal we chose the controversial issue of abortion. Regarding this issue, it is commonly known that there is a disagreement between these two fractions in Germany. While Catholics generally disapprove of abortion, Evangelics favour women’s self-determination. We asked members of the two different subgroups (e.g. Catholics and Evangelics) to participate in our study. The central question with regard to the chosen relevant goal was which position the two subgroups and the SOG claim concerning the forbiddance vs. allowance of abortion.

### ***I. 3.1.1. Method***

#### *Design and Participants:*

Hundred-two participants recruited from Catholic and Evangelic students' parishes, church choirs and the deaconry completed our questionnaire. The participants' mean age was 27.00 years ( $SD = 10.47$ ,  $range = 17-81$ ); 62 female, 40 male. Participants were rewarded with 3 €. It took them approximately 25 minutes to complete the questionnaire.

#### *Procedure:*

Participants were given a questionnaire with the instruction that the present study referred to Catholic and Evangelic Christians, and their thoughts about Christian goals. The questionnaire started with questions concerning participants' group membership and their IG identification. Afterwards participants were informed that goals can be classified in two structurally different goal types, (e.g. Minimal vs. Maximal goals). It was explained that in



case of an “absolute” (e.g. Minimal) goal something has to be achieved or avoided in any event, whereas in case of a “gradual” (e.g. Maximal) goal something should be achieved or avoided as much as possible. Following this, participants answered questions concerning the goal positions and goal types of the two subgroups on “the allowance of abortion”. The order of the ratings for the two subgroups was counterbalanced. Participants were asked to rate the goal position of each subgroup on a 6-point scale; ranging from -3 (forbiddance of abortion) to +3 (allowance of abortion). The associated goal type was measured by a dichotomous item termed “The goal of Catholic-/ Evangelic Christians is an absolute vs. gradual goal”. After the assessment of the attitude towards the OG, participants had to indicate their identification with the SOG and rated the goal position and goal type of the SOG in the same way as for the two subgroups. Finally socio-demographic variables were assessed. Additional items were included in the questionnaire for exploratory purposes that are not relevant regarding the present paper.

### **Identification with the IG and Identification with the SOG**

Participants identification with the IG and with the SOG was assessed by two separate 5-item scales; the items had to be answered on a 5-point scale ranging from 1 = *not agree* to 5 = *agree*. Items were termed similar for both scales (e.g. “I feel connected to my religious denomination/ “Real” Christians.”, reverse coded “I do not identify with my religious denomination/ “Real” Christians.”) The respective items for the IG vs. SOG identification were averaged; Cronbach’s  $\alpha_{IGidentification} = .90$ , Cronbach’s  $\alpha_{SOGidentification} = .873$ .

### **Relative Ingroup Prototypicality**

A RIP-score was calculated through the meta contrast ratio (see Turner et al., 1987) of the agreement among IG and SOG and the agreement among OG and SOG concerning the perceived goal positions. To generate a score displaying the agreement with the SOG we subtracted the rated goal position of the respective subgroup from those of the rated goal position of the SOG. The resulting two “disagreement” scores could range from -6 to 6. An absolute value of these “disagreement” scores was calculated (ranging from 0 to 6); the absolute value was recoded by subtracting it from 7 in order to prevent the possibility of a division by zero. The agreement-scores of the two subgroups with the SOG served as the basis for the preliminary analysis (see first section of the results section).

Finally, the relevant RIP-score was computed by dividing the agreement-score of the respective IG and SOG by the agreement-score of OG and SOG. The resulting measure could vary between 0.14 and 7. Higher scores displayed more RIP.

### **Attitudes towards the Outgroup**

Attitudes towards each subgroup were measured on an 8-item scale; all items had to be answered on a 5-point scale ranging from 1 = *not agree* to 5 = *agree*. To measure the attitudes toward the OG in their different facets, the items included the evaluation of and behaviour towards the two subgroups (e.g., “I disapprove of Evangelics/ Catholics with regard to its goal position towards the allowance of abortion”; “Because of their goal position towards the abortion issue, one should stay away from the Evangelics/ Catholics”; *recoded*: “Evangelics/ Catholics should be supported regarding their goal position towards the abortion issue.”) and exclusion (e.g., “Evangelics/ Catholics are in terms of their goal position towards the allowance of abortion no real Christians”). Based on the group membership of our participants, we coded an OG attitude scale by averaging responses of the respective OG items. A factor analysis revealed a strong first factor (eigenvalue: 4.1) explaining 52 % of the variance, on which all items loaded with .30 and greater. We ignored a weaker second factor (eigenvalue: 1.2) and treated only the eight items as indicators of a general concept of attitudes toward the OG (Cronbach’s  $\alpha = .86$ ).

### ***I. 3.1.2. Results***

#### *Preliminary Analysis: Ingroup Projection & Perspective Divergence Hypothesis*

We tested whether members of the two subgroups would consider their respective IG goal as more relatively prototypical for the SOG. The agreement of Catholics and Evangelics (target group) with the SOG Christians, from the perspectives of Catholics and Evangelics (participant group), were subjected to a 2 (participant group)  $\times$  2 (target group) ANOVA, with repeated measures on the latter factor. The analysis yielded the expected significant interaction of participant group and target group,  $F(1, 96) = 6.87, p = .010, \text{partial } \eta^2 = .07$ . In line with Hypothesis 1, Evangelic Christians perceived the goal position of the Evangelic Christians (i.e. their IG’s goal position) to be more prototypical for the SOG than the goal position of the Catholic Christians (i.e. the respective OG goal position). However, Catholic Christians showed no significant difference with regard to the prototypicality of the goal positions of both subgroups. Nevertheless, comparing the perception of the two subgroups

regarding each of the two goal positions separately, the results showed that Catholic Christians did perceive their IG goal position as more prototypical than this was done by Evangelic Christians (see Table 1). The goal position of the Evangelic Christians was perceived as equally prototypical by both participant groups.

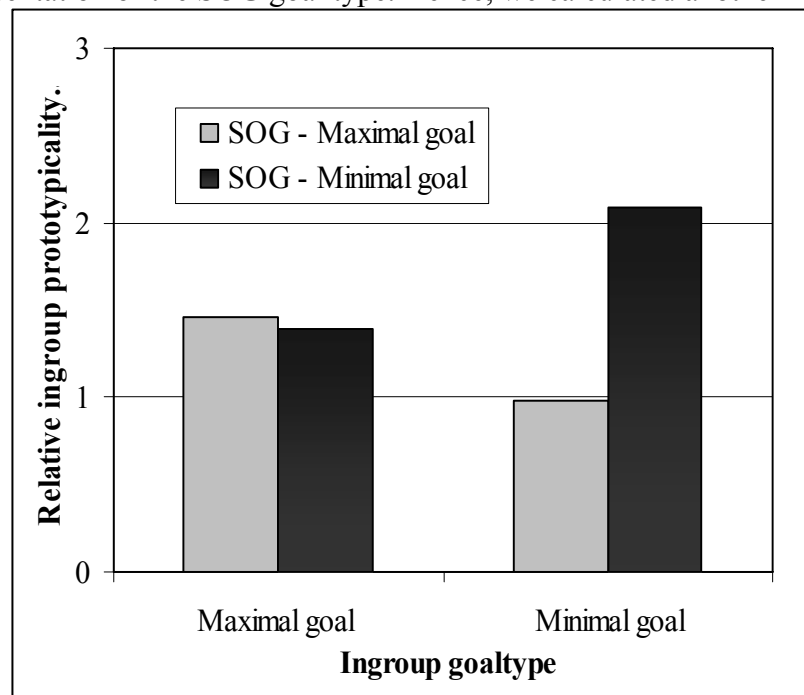
*Table 1 Perceived agreement with the SOG as a function of Target group (IG/ OG) and Participant group in Study I.1.*

	Agreement of IG & SOG		Agreement of OG & SOG	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Evangelic Christians	5.27	1.48	4.18	1.85
Catholic Christians	5.13	1.55	5.29	1.90

### *Goal Type Hypothesis*

We predicted that RIP would be particularly high if the relevant IG goal is represented as a minimal goal compared to when the IG goal is represented as a maximal goal. Thus, we conducted an analysis of variance (ANOVA) with RIP as the dependent variable and the independent between subjects factor IG goal type. There was no main effect of IG goal type,  $F(1, 96) = .54, p = .464, \text{partial } \eta^2 = .01$ .

However, assuming that the IG goal type is projected onto the SOG goal type leading to an agreement of the two goal types, we expected that the projection of IG goals should also have an influence on the representation of the SOG goal type. Hence, we calculated another analysis, including the SOG goal type. We also included the two measures of identification (identification with the IG and identification with the SOG) in the analysis in order to rule out that possible effects might be caused by the degree of identification. The analysis revealed an interaction of the IG goal type and SOG goal type,  $F(1, 95) = 5.31, p =$



*Figure 1 RIP as a function of IG & SOG goal type in Study I.1.*

.024, *partial*  $\eta^2 = .06$ , indicating that RIP was highest when the goal types of IG and SOG were represented as minimal goals (see Figure 1). Simple comparisons showed that if IG and SOG goals were perceived as minimal goals the resulting RIP ( $M_{IGmin/SOGmin} = 2.09$ ,  $SE = .237$ ) differed significantly or marginal significantly from the other 3 combinations ( $M_{IGmax/SOGmax} = 1.46$ ,  $SE = .194$ ;  $M_{IGmin/SOGmax} = .98$ ,  $SE = .292$ ;  $M_{IGmax/SOGmin} = 1.39$ ,  $SE = .290$ ). Thus, it appears that IG minimal goals entail a higher RIP when the goal type is also projected on the SOG leading to an agreement with the SOG in terms of the goal type (see Figure 1). The interaction of the two goal types was significant even though we controlled for the identification with the IG and the identification with the SOG by including these measures in the analysis. Thus, the goal type effect appeared to be independent of participants' identification; the degree of identification was not responsible for this result.

In line with the assumption of projection of both goal type and goal position it was expected that the type of the IG goal would also be projected onto the SOG goal type. To test this assumption, we analyzed the relation of both goal types by calculating the coefficient Phi<sup>1</sup>, which is the appropriate coefficient for the analysis of the relation of two dichotomous variables. As expected the analysis revealed a positive relation between IG goal type and the goal type of the SOG ( $\phi = .321$ ,  $p = .001$ ). The congruence of these two goal types indicate that the type of the IG goal is projected onto the SOG goal type.

### *Relative Ingroup Prototypicality & Attitudes towards the Outgroup Hypothesis*

We analyzed the relationship of RIP and the attitudes towards the OG. Results confirmed the predicted relationship between perceived RIP and the attitudes towards the OG,  $r = .280$ ,  $p = .005$ . A higher RIP was related to more negative attitudes towards the OG.

### **I. 3.1.3. Discussion**

Study I.1 was conducted in order to provide evidence for our two central hypotheses; which are the impact of the goal type on ingroup projection and the relationship between the resulting RIP and the attitudes towards the outgroup.

However, at first, a preliminary analysis was conducted to confirm the presupposition that IG goals are projected onto the prototype of the SOG just like it is the case for IG

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<sup>1</sup> Whereas chi-square is known to be the appropriate coefficient in case of testing the relation of nominal data, the coefficient Phi is the adequate coefficient in the special case of two dichotomous, nominal variables. Therefore, we chose Phi to calculate the analyses.

attributes. In particular, participants perceived the IG goal as being more prototypical for the SOG compared to OG goals, which is shown by the perspective divergence between the two different subgroups Catholic and Evangelic Christians.

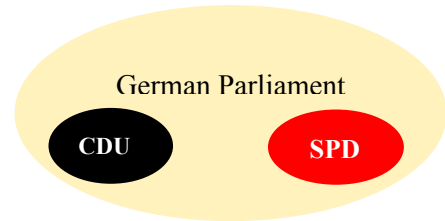
With regard to our *Goal Type Hypothesis*, Study I.1 yielded empirical evidence that the type of IG goal plays an important role in RIP. However, according to the results minimal IG goals do not entail a higher RIP per se as was expected. It appeared that projection of the IG goal is also depending upon the SOG goal type. Specifically, a minimal IG goal led to a higher RIP when there was an agreement of IG and SOG goal type indicating a projection of the IG goal type onto the SOG goal type. It was also shown that the effect was independent from the degree of identification with the IG and the degree of identification with the SOG. Thus, the heightened relative prototypicality in case of a minimal goal of IG and SOG was not caused by participants' identification.

Furthermore, it could be shown that there is congruence among the IG goal type and the goal type of the SOG, which represents another confirmation for the assumption that the type of the goal is also projected onto the SOG. Following these results, a slight modification of the *Goal Type Hypothesis* is made necessary, by including the SOG goal type. Thus, we assume that RIP will be particularly high, if the relevant IG goal is a minimal goal and if the IG and SOG goal types are congruent due to the projection of the IG goal type on the SOG goal type. Replicating the above results by means of another study is necessary to provide evidence for the validity of the modified hypothesis.

Concerning the second central hypothesis involving *RIP and OG-attitudes*, the results confirmed that a higher RIP was related to more negative attitudes towards the OG. In particular, since different aspects of were included in the measurement of OG-attitudes, negative evaluation of and negative behavioural intentions towards the OG as well as exclusion tendencies were more pronounced when the goal position of the IG was regarded as more relatively prototypical.

Taken the above findings together, Study I.1 contains first empirical evidence concerning the hypotheses. However, a replication of the above results on behalf of another study dealing with another intergroup context is deemed to be necessary in terms of a reliable generalisation and would be a convincing confirmation of our hypotheses.

### I. 3.2. Study I.2 – The Perception of Political Goals



Study I.2 was conducted in order to replicate and extend the findings from the former study within another intergroup context. In the previous study we investigated individuals' representation of the actual goal positions of the groups. However, an actual goal representation only represents a status quo or in other words the actual representation only describes which goal a group is striving for. Specifically, it does not necessarily imply that the group also really wants to strive for this goal and it remains unclear whether group members expect their group to have this specific goal position. The crucial point is that one has to consider the *actual* goal position and also the preferred *ideal* goal position. It is assumed that the ideal goal position is more strongly defined by motivational aspects, because - according to Higgins' (1987) self-discrepancy-theory – individuals are motivated to strive for and receive their ideals representations. Thus, we wanted to explore whether ingroup projection also applies and might be even stronger for the representation of an *ideal* SOG. We included questions asking for the goal position that the SOG ideally should claim. We tested the same hypotheses as in Study I.1 and extended them by including a comparison between the RIP calculated by the goal position of the *actual* SOG with the RIP stemming from the goal position of the *ideal* SOG.

In Study I.2, we applied our approach to an intergroup context with a political dimension, namely to the political parties of Germany. We focused on members of the two major parties the CDU (Christian Democratic Union) and the SPD (Social-democratic Party of Germany). The respective SOG was the democratically elected German parliament. In order to heighten the generalizability we included two different political goals. The chosen goals were “the elimination of nuclear power in Germany”, and “Turkey's accession to the EU”. Again preliminary analyses were carried out to ensure that the goal position of the respective IG was projected onto the *actual*, which should become apparent in a perspective divergence between members of the two parties. Additionally, we analyzed if the IG goal position was also projected onto the *ideal* SOG,

As in Study I.1, we expected RIP to be highest, if the goal of the IG and the SOG is a minimal goal. Moreover, both goal types were expected to correlate. The second hypothesis of interest referred to the relation of RIP and the attitudes towards the OG. More specifically, we investigated the relation of OG-attitudes and RIP stemming from the *actual* SOG in comparison to RIP stemming from the *ideal* SOG.

### ***I. 3.2.1 Method***

#### *Design and Participants:*

Sixty-five participants, associated with one of the two major political parties (CDU/SPD) from 3 different cities of East Germany (e.g. Erfurt, Jena and Leipzig), took part. Mean age was  $M = 27.25$  years ( $SD = 10.7$ ,  $range = 18-74$ ). 17 female and 47 male, one did not indicate their gender. Participants were compensated with 3 €. The completion of the questionnaire took approximately 30 minutes.

#### *Procedure:*

The questionnaire was handed out with the instruction that the study referred to two actual debated political goals; the elimination of nuclear power in Germany, and Turkey's accession to the European Union. First participants were asked questions concerning group membership and IG identification. Then the structure of minimal and maximal goals was explained in the same manner as with Study I.1. The questionnaire contained primarily questions about the goal positions of the two subgroups towards the two goals "elimination of nuclear power" and "Turkey's accession to the EU". The order of subgroups and goals was randomized. Goal positions had to be rated on a 6-point scale; ranging from -3 (prevention of nuclear power elimination/ Turkey's EU accession) to +3 (achievement of nuclear power elimination/ Turkey's EU accession). The respective associated goal types were assessed with a dichotomous item. After the measurement of the attitude towards the OG, participants rated the goal position and goal type of the actual SOG and the ideal SOG. Finally, demographic variables were assessed. Additional items for exploratory purposes were included.

### **Relative Ingroup Prototypicality**

The scores for the agreement of the subgroups with the SOG and the resulting RIP was calculated in the same way as in Study I.1. Higher scores represent more RIP. We computed two different RIP scores with regard to each of the two goals. The first was calculated from the value of the perceived actual goal position of the SOG, whereas the second was computed with the value from the ideal goal position. We will, later in this paper, refer to the former by RIP regarding the *actual* SOG, and to the latter by RIP regarding the *ideal* SOG.

### **Attitudes towards the Outgroup**

Participants' attitudes towards both parties were assessed similar to the previous study on an 8-item scale, but separately for each of the two goals. They were explicitly told to solely consider the goal positions of the subgroups towards the respective goal situation. Several issues were measured, such as the evaluation of and behaviour towards the subgroups (e.g., "I disapprove .... with regard to its goal position towards the elimination of nuclear power"; "One should stay away from ...") and exclusion (e.g., "... shouldn't be a part of the German government in terms of their goal position towards the elimination of nuclear power"). Similarly to methods employed in Study I.1, we calculated the OG attitude scale according to the membership of our participants from the mean values of the respective OG scale. Attitude scales were computed for the two different goals separately.

With regard to the different goals, we calculated 2 separate factor analyses. Both analyses revealed a strong first factor (eigenvalue goal 1: 4.7, eigenvalue goal 2: 4.7), explaining 58 % and 59% of the variance. The factor analysis of goal 1 revealed a weaker second factor (eigenvalue: 1.0) which was ignored. Regarding goal 1, the 8 items loaded greater than .26 on the first factor. In the case of goal 2, the 8 items loaded greater than .32 on the first factor. Accordingly, we treated the respective items with regard to each goal as indicators of a general concept (Cronbach's  $\alpha$  goal 1 = .88, Cronbach's  $\alpha$  goal 2 = .89).

### ***I. 3.2.2. Results***

Results will be presented in 3 parts. The first part contains the preliminary analyses and in part 2 and 3 results concerning the two central hypotheses are reported. The hypotheses were analyzed separately for the two different goals. The patterns of the results are consistent across the two goals, and therefore will be presented together.

#### *Preliminary Analyses: Ingroup Projection & Perspective Divergence Hypothesis*

##### *Goal 1 & Goal 2 – Projection to actual SOG*

Since it was hypothesized that projection of IG goals would result in a perspective divergence between different subgroups, we tested whether members of both political parties differed in their representations of the *actual* SOG. As in Study I.1 we subjected the goal agreement of the two subgroups with the *actual* SOG to a 2 (participant group) x 2 (target group) ANOVA, with repeated measures on the latter factor. According to our two goals, two separate analyses were conducted. Both analyses yielded the expected significant interaction,



*Goal 1 – “elimination of nuclear power”*:  $F(1, 56) = 5.87, p = .019, \text{partial } \eta^2 = .10$ ; *Goal 2 - Turkey’s EU accession*:  $F(1, 57) = 12.03, p = .001, \text{partial } \eta^2 = .17$ . Simple comparisons showed that SPD members perceived the goal positions of the SPD as more prototypical for the *actual* SOG (e.g. German parliament) than did CDU members. Similarly, CDU members perceived the goal positions of their party to be more prototypical for the *actual* SOG than did SPD members (see Table 2 and Figure 2).

However, in terms of goal 1 (i.e. “elimination of nuclear power”) there was also a significant main effect of target group,  $F(1, 56) = 13.35, p = .001, \text{partial } \eta^2 = .19$ , indicating that the goal position of the SPD towards “the elimination of nuclear power” was generally considered as more prototypical ( $M = 5.24, SD = 1.43$ ) than the goal position of the CDU ( $M = 3.86, SD = 1.47$ ).

*Table 2. Perceived agreement with the actual SOG as a function of Target group (IG/ OG) and Participant group in Study I.2.*

		Agreement of IG & <i>actual</i> SOG		Agreement of OG & <i>actual</i> SOG	
		<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Goal 1	SPD members	5.56	1.33	3.50	1.26
	CDU members	4.38	1.61	4.79	1.47
Goal 2	SPD members	5.60	1.17	3.89	1.30
	CDU members	5.00	1.53	4.33	1.74

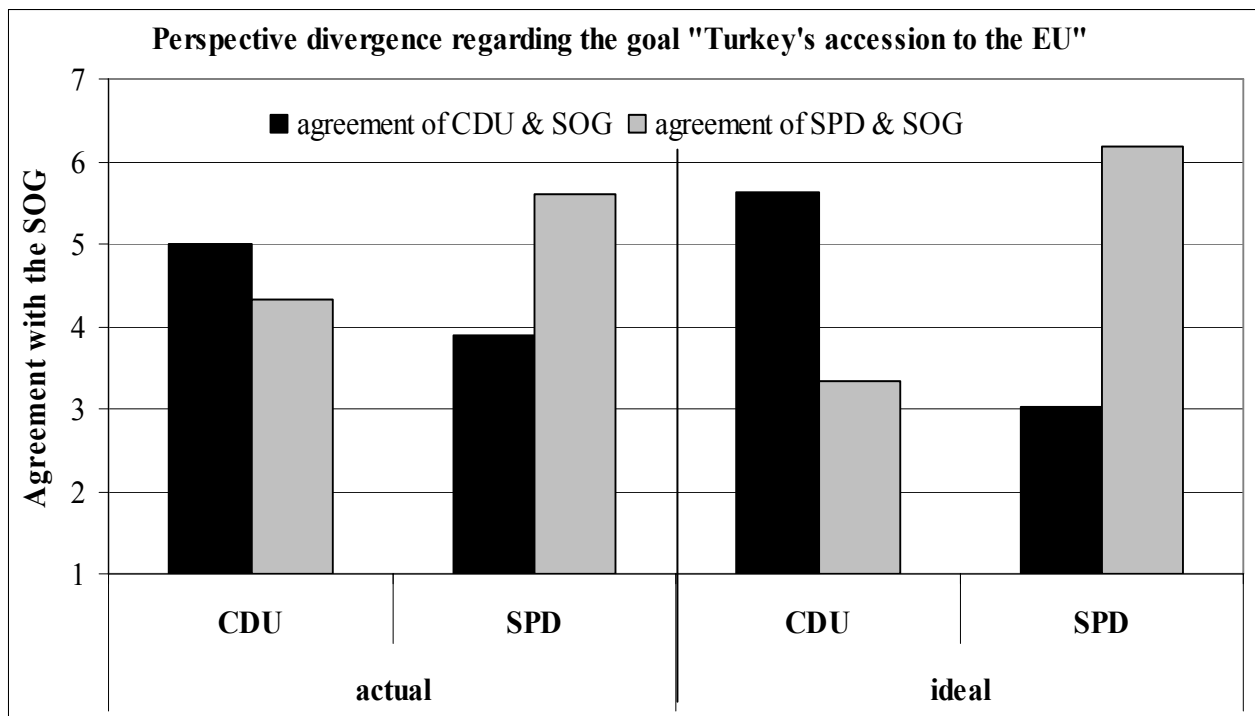
#### *Goal 1 & Goal 2 - Projection to ideal SOG*

It was assumed that the IG goal position (regarding goal 1 and 2) was perceived as being particularly prototypical regarding the representation of the *ideal* SOG. This in turn, was expected to result in an especially strong perspective divergence between the two subgroups. For each goal, we calculated one repeated-measures ANOVA, including the agreement of the target group (SPD/ CDU) with the *ideal* SOG as within subjects factor and participant group as the between subjects factor. Both analyses revealed highly significant interactions of target group and participant group, *Goal 1 – “elimination of nuclear power”*:  $F(1, 57) = 16.58, p < .001, \text{partial } \eta^2 = .23$ ; *Goal 2 - Turkey’s EU accession*:  $F(1, 57) = 65.98, p < .001, \text{partial } \eta^2 = .54$ . As expected, members of the SPD perceived the SPD to be much more prototypical for the *ideal* SOG than did CDU members. In comparison to that, CDU members perceived the goal positions (regarding goal 1 & 2) of their party, the CDU, to be more prototypical for the *ideal* SOG than did SPD members (see Table 3 and Figure 2).

However, regarding goal 1 there was still a main effect of the factor target group,  $F(1, 57) = 7.81$   $p = .007$ ,  $partial \eta^2 = .12$ , indicating that the goal position of the SPD ( $M = 5.07$ ,  $SD = 1.87$ ) towards “the elimination of nuclear power” was generally perceived as more prototypical than the position of the CDU ( $M = 3.56$ ,  $SD = 1.87$ ).

*Table 3. Perceived agreement with the ideal SOG as a function of Target group (IG/ OG) and Participant group in Study I.2.*

		Agreement of IG & ideal SOG		Agreement of OG & ideal SOG	
		<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Goal 1	SPD members	5.80	1.39	2.89	1.68
	CDU members	4.54	1.72	4.00	2.00
Goal 2	SPD members	6.17	1.04	3.03	1.64
	CDU members	5.63	1.38	3.33	1.61



*Figure 2 Perceived goal agreement with the ideal SOG as a function of Target group (CDU/ SPD) and Participant group (CDU/ SPD) in Study I.2.*

### *Goal Type Hypothesis*

#### *Goal 1 & Goal 2 – Projection to actual SOG*

In line with Study I.1, it was hypothesized that RIP would be highest if the IG goal as well as the *actual* SOG goal is a minimal goal. For each of the relevant two goals, we calculated the same contrast analysis. The goal type of IG and SOG were combined and the following four cells emerged; IGmax/SOGmax, IGmin/SOGmax, IGmax/SOGmin and IGmin/SOGmin. According to our hypothesis, the IGmin/SOGmin cell was contrasted with the other three cells  $(-1, -1, -1, 3)$ . The contrast effect was significant, *Goal 1 – “elimination of nuclear power”*:  $F(1, 55) = 8.35, p = .006, \text{partial } \eta^2 = .14$ ; *Goal 2 - Turkey’s EU accession*:  $F(1, 55) = 4.32, p = .042, \text{partial } \eta^2 = .07$ . In case of both goals, RIP was highest when the goal was a minimal goal for both IG and *actual* SOG. Since there were no significant residual between-group differences for the contrast,  $F_{Goal1}(1, 55) = 0.97, p = .329$ ;  $F_{Goal2}(1, 55) = 1.91, p = .173$ , the relation of IG goal type, *actual* SOG goal type and RIP was best described in the predicted way.

Further analyses revealed that there was no congruence among the goal type of IG and *actual* SOG in case of goal 1 ( $\phi_{Goal1} = .041, p = .757$ ), whereas for goal 2 there was the expected congruence among goal type of IG and *actual* SOG ( $\phi_{Goal2} = .397, p = .002$ ) indicating that the goal types did correlate.

#### *Goal 1 & Goal 2 – Projection to ideal SOG*

According to the results from the analyses of hypothesis 1 (see section “Ingroup projection of goals & Divergence on perceived prototypicality”), ingroup projection is apparently much more pronounced with regard to the *ideal* SOG. Thus, we calculated an additional analysis for examining the relationship of the IG goal type and RIP regarding the *ideal* SOG. For both goals, an analysis of variance ANOVA with RIP regarding the *ideal* SOG as the dependent variable, and IG goal type as independent between subjects factor was computed. In the cases of both analyses (e.g. for goal 1 and 2), a significant main effect of IG goal type emerged, *Goal 1 – “elimination of nuclear power”*:  $F(1, 57) = 7.82, p = .007, \text{partial } \eta^2 = .12$ ; *Goal 2 - Turkey’s EU accession*:  $F(1, 57) = 4.78, p = .033, \text{partial } \eta^2 = .08$ , indicating that RIP regarding the *ideal* SOG was higher when the IG goal was a minimal goal ( $M_{Goal1} = 3.33, SD = 2.50$ ;  $M_{Goal2} = 3.59, SD = 2.27$ ), in comparison to when the IG goal was represented as a maximal goal ( $M_{Goal1} = 1.88, SD = 1.40$ ;  $M_{Goal2} = 2.36, SD = 1.68$ ).

Regarding the relation of IG and *ideal* SOG goal type, in the cases of goal 1 and goal 2, the coefficient Phi showed the expected congruence among the goal type of IG and *ideal* SOG,  $\phi_{Goal1} = .254, p = .051$ ;  $\phi_{Goal2} = .277, p = .033$ .

*Relative Ingroup Prototypicality & Attitudes towards the Outgroup Hypothesis**Goal 1 & Goal 2*

In accordance with our hypothesis, in case of both goals (e.g. “*elimination of nuclear power*”, *Turkey’s EU accession*) the results showed the expected relation between perceived RIP regarding the *actual* SOG and attitudes towards the OG,  $r_{Goal1} = .243, p = .066$ ;  $r_{Goal2} = .277, p = .034$ , indicating that higher RIP regarding the *actual* SOG was related to more negative OG attitudes. Furthermore, analyses including RIP regarding the *ideal* SOG and attitudes towards the OG revealed highly significant correlations,  $r_{Goal1} = .515, p < .001$ ;  $r_{Goal2} = .431, p < .001$ .

In order to investigate whether RIP regarding the *actual* SOG, or RIP regarding the *ideal* SOG is more important for the prediction of the attitudes towards the OG, we conducted separately for each goal (e.g. “*elimination of nuclear power*”, *Turkey’s EU accession*) a multiple regression analysis, with attitudes towards the OG as the dependent variable, and subjected both kinds of prototypicality scores as predictors to the analysis. Concerning both goals, the results show that the standardized regression coefficient between RIP regarding the *actual* SOG and attitudes towards the OG was not significant,  $\beta_{Goal1} = -.013, p = .921$ ;  $\beta_{Goal2} = .142, p = .281$ , whereas the regression coefficient for RIP regarding the *ideal* SOG; remained a significant predictor of the attitudes towards the OG,  $\beta_{Goal1} = -.532, p < .001$ ;  $\beta_{Goal2} = .355, p = .010$ .

**I. 3.2.3. Discussion**

The study yielded evidence for our predictions across two different political goals, they being the elimination of nuclear power, and Turkey’s accession to the EU. The analyses for both goals revealed the same pattern of results, and therefore will be discussed together.

The preliminary analyses involving the presupposition of ingroup projection being due to goals, confirmed again that members of different subgroups differ in their view on the prototypicality of the goal positions of the two subgroups (e.g. political parties). Thus, the respective IG goal is projected onto the *actual* SOG (e.g. the German parliament) resulting in a perspective divergence between members of both parties. In addition to the *actual* SOG, Study I.2 also considered the *ideal* representation of the SOG. It was shown that the divergence of perspectives is particularly high regarding the *ideal* SOG.

However, concerning the specific goal “elimination of nuclear power”, it appeared that the SPD, which is in favour of nuclear power elimination, is generally considered as being more prototypical. The preference of this goal position is probably due to recent public debates regarding climate protection, and reminds us that social reality may constrain the possibility to project IG features onto the SOG (see Ellemers, Van Rijswijk, Roefs, & Simons, 1997). In terms of the *ideal* SOG, the SPD is still perceived as being more prototypical, but not so much as it was for the case of the *actual* SOG. This could be an indication of reduced reality constraints when it comes to the representation of the *ideal* SOG. In other words, the projection of IG goals seems to be stronger considering the *ideal* SOG because of a less concrete, or rather more vague existing representation, leaving more space for projection. Moreover, the projection of IG features onto the *ideal* SOG might be driven more strongly by motivational aspects and therefore offers a clearer picture of ingroup projection depending on participants “wish” to perceive the IG as prototypical.

The results of Study I.2 replicate the findings of the previous study regarding the *goal type*. Minimal IG goals are perceived as particularly prototypical for the *actual* SOG, restricted to the proviso that the respective goal of the *actual* SOG is also a minimal goal. However, in terms of the *ideal* SOG, minimal IG goals do entail more ingroup projection per se and thus are perceived as particularly prototypical for the *ideal* representation of the SOG. The differential results regarding *actual* and *ideal* SOG and the IG goal type might be due to less reality constraints in case of the latter.

Moreover, it was shown that the goal types of IG and *actual* SOG, as well as *ideal* SOG are related to each other. Thus, it is highly probable that the IG goal type is projected onto the *actual* representation of the SOG, as well as to the *ideal* SOG.

Furthermore, in line with the two former studies, the results confirmed the relation between RIP and the attitudes towards the OG. The more prototypical the IG is perceived to be for the *actual*, as well as for the *ideal* SOG, the more negative are evaluation of and behaviour towards the OG and the higher the designated OG exclusion. Empirical evidence attests that attitudes towards the OG are more definite depending on the *ideal* SOG. Thus, the representation of the *ideal* SOG is apparently much more important than the *actual* SOG for an accurate prediction of attitudes towards OGs.



### I. 3.3. Study I.3 –The Tightening of the Abortion Laws

The aim of Study I.3 was to confirm the findings of the previous quasi-experimental studies with an experimental design. The current study examines whether the projection of goals differs, depending on the respective induced goal type representation. In particular, participants with a minimal goal mindset (e.g. minimal goal orientation) were expected to perceive the IG goal as more relatively prototypical, compared to participants in the maximal goal condition.

#### *Mindset manipulation & Goal type*

Mindsets, which are termed as cognitive procedures related to how one chooses between various alternatives, have been used in several different ways (see Gollwitzer, Heckhausen, & Steller, 1990; Galinsky & Moskowitz, 2000). For example, mindsets were activated via priming that makes participants behave or think in line with the primed mindset in an unrelated context (Bargh & Chartrand, 2000).

Applying the mindset idea to the representation of goal types, we argue that inducing a minimal goal mindset vs. maximal goal mindset should cause a differential projection of IG goals. Participants having a minimal goal mindset are expected to perceive the goal of their IG as particularly prototypical for the SOG, compared to when a maximal goal mindset is activated. Recently, Schubert et al. (2008) developed a goal type manipulation, employing the well-known concentration test d2 (Brickenkamp, 1994). Participants were given specific instructions according to the respective goal type, and had to complete the d2 via paper pencil task. On the basis of this procedure, we conducted a similar goal type manipulation for our computer driven experiment (see method section).

In Study I.3, Germans were the relevant IG and Poles were the OG. The respective inclusive category was the European Union. The study referred to the publicly debated topic of “Tightening of the abortion laws within the European community of states”, a debate brought up by the Polish Government. Since participants were German students, it was hypothesized that they perceive more agreement among Germany and the European Union than among Poland and the EU. Thus, the IG goal should be perceived as relatively prototypical. Moreover, ingroup projection is expected to be more pronounced in the minimal goal mindset condition and therefore should result in a higher RIP. Furthermore, we expected a high RIP to be connected to negative evaluations of, negative behavioural intentions

towards and greater exclusion tendencies towards the OG. As shown in Study I.2, RIP with regard to the *ideal* SOG is of particular importance for the prediction of attitudes towards the OG. Thus, we predicted that the RIP regarding the *ideal* SOG would be the more crucial predictor, compared to RIP regarding the *actual* SOG.

### ***I. 3.3.1. Method***

#### *Design and Participants*

The experiment had one between participants variable with two levels (Mindset: minimal vs. maximal goal orientation). Seventy four students from the University of Jena completed the experiment and received a breakfast-coupon as compensation. Mean age was 23.5 years ( $SD = 3.57$ , range: 19-38); 42 female, 32 male. It took them approximately 15 minutes to complete the experiment.

#### *Mindset Manipulation:*

Schubert et al. (2008) applied the so-called d2-Test, originally developed to test both concentration and performance (Brickenkamp, 1994), in order to induce a goal type mindset. The original procedure of the d2-test is as follows: Participants are presented with rows of letters on paper. Letters are randomly mixed *ds* and *ps* and each letter has dashes above or/and below. The participants' task is to tick the *ds* with two dashes as fast and accurately as possible. The time per row is limited. Schubert et al. (2008) altered the instruction of the d2-Test to produce a minimal or maximal goal mindset. In the present study, we used a similar procedure on a computer. All participants were to complete several rows of letters within a specific time limit. In the *minimal goal* condition, participants were instructed to tick *all ds* with two dashes and to manage the *completion of the first half* of each row. Participants in the *maximal goal* condition were instructed to tick *as many ds* with two dashes *as possible* and to *complete the rows as far as possible* within the time limit. To further emphasize this instruction, in the minimal goal condition the first half of the row was highlighted by a red coloured background and the second half of the row was coloured green, whereas in the maximal goal condition the *colour of the background* of the row changed gradually from red to green (see Figure 3 a & b). Furthermore, to enhance the commitment of the participants, it was announced that the best 25% of all participants would receive an additional reward. All further instructions were constant across the conditions.

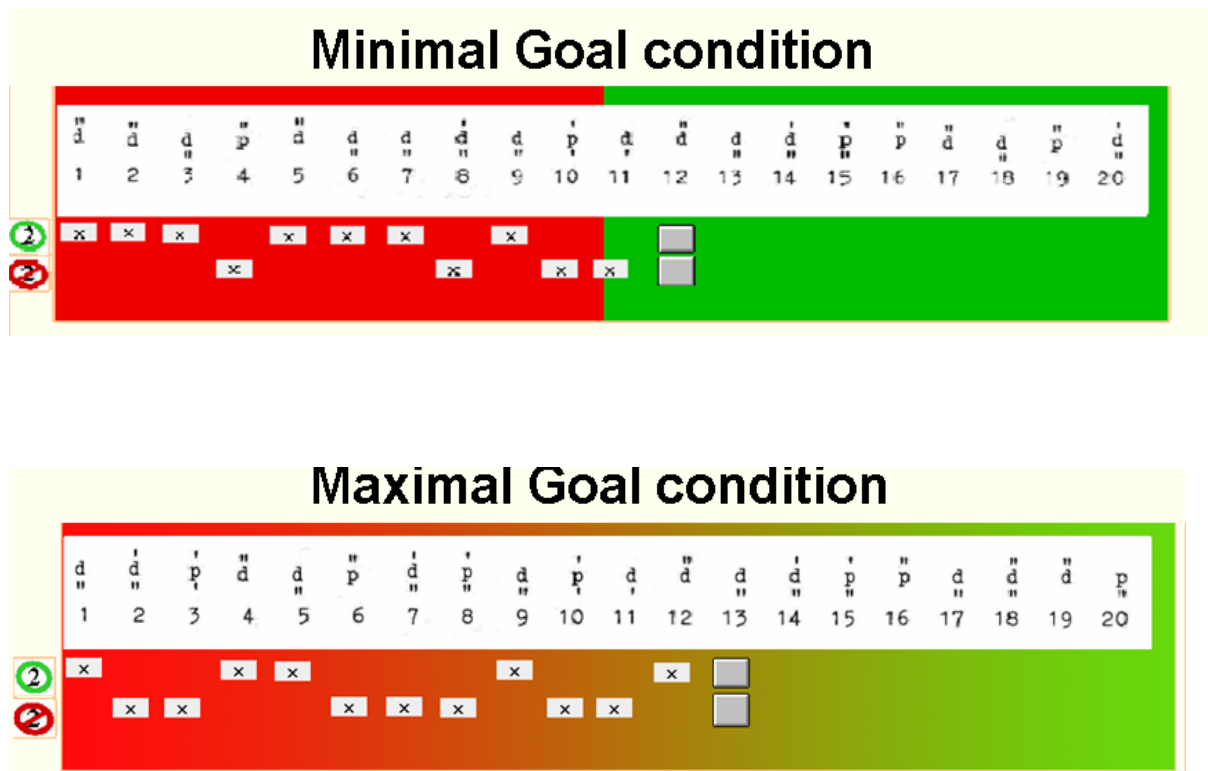


Figure 3a and b: Manipulation of the goal type orientation

### Procedure

The participants arrived in the lab and received an informed consent with the instruction that the study focuses on the issue tightening abortion laws within the European community of states, and their task would be to answer several questions concerned with this issue. They were informed that parallel to these questions they would have to pass a concentration test. The computer based experiment started with the first part of this concentration task. During the experiment participants were repeatedly asked to complete further parts of the concentration test. This concentration task was used for the manipulation of the goal type (see former section: Mindset Manipulation).

After the assessment of demographic variables and the first part of the concentration test, participants were presented with a short audio sequence from the recent radio news that provided them with information to the actual political debate of Poland on the European abortion laws. Following this, they answered several questions concerning the attitude of Poland, Germany and the EU towards “the tightening of the abortion laws”. Participants were asked to estimate the goal positions of the groups on a 6-point scale; ranging from -3 (doesn’t want a tightening of the abortion laws) to +3 (does want to tighten the abortion laws).

Furthermore, they had to indicate the goal position that ideally should be pursued by the European Union. In the cases of Germany, Poland and the EU, as well as for the ideal EU, the



respective associated goal type was assessed by 3 specific items that had been tested previously within several pretests and studies. Following this, we assessed attitudes towards the out-group and participants had to rate their personal degree of identification with the IG (Germany) and the SOG (EU).

### **Goal Type manipulation check**

To check whether the manipulation was successful, first we analyzed if goal type perception was measured reliably across the 3 items (e.g. max “This goal position is less elementary to Germany.”, e.g. min “Referring to this, Germany argues an immovable goal position.”) (Cronbach’s  $\alpha = .71$ ). Secondly, the average score of all items was subjected as the dependent variable to an analysis of variance (ANOVA) with the independent between subjects factor goal type condition. There was no main effect of the goal type condition,  $F(1, 73) = .398, p_{(one-tailed)} = .265$ . Thus, results of the following analyses should be interpreted with caution.

### **Relative Ingroup Prototypicality**

RIP was calculated again through a meta contrast ratio. As in Study I.2, two different RIP-scores were computed; the first one was the RIP regarding the *actual* SOG and the second was RIP regarding the *ideal* SOG.

### **Attitudes towards the Outgroup**

Attitudes towards the OG were measured on a 7-item scale. The items were derived from our previous studies, and included the evaluation of the OG (e.g., “I disapprove of Poland with regard to its goal position towards the tightening of the abortion laws within the European community of states”), behaviour (e.g., “One should stay away from Poland”) and exclusion (e.g., “Poland should not be part of the European Union.”). Considering all 7 items, a factor analysis revealed a strong first factor (eigenvalue: 4.1), explaining 59% of the variance, on which all 7 items loaded greater than .32. Thus, we treated all items as indicators of a general concept of attitudes towards the OG (Cronbach’s  $\alpha = .87$ ).

### I. 3.3.2. Results

#### *Preliminary Analyses: Ingroup Projection*

We predicted that the IG (Germany) would be regarded as more prototypical than OG (Poland) for the *actual* and for the *ideal* SOG (EU) in terms of the considered goal. We separately analyzed whether the RIP scores regarding the *actual* and the *ideal* SOG differed from 1, as values above 1 indicate that there is more relative agreement among IG and SOG. The analyses yielded significant effects; ( $t_{actualRIP}(73) = 5.36, p < .001$ ;  $t_{idealRIP}(73) = 5.92, p < .001$ ). Thus, the goal position of the IG was considered as relatively more prototypical for both the *actual* and *ideal* SOG.

#### *Goal Type Hypothesis*

In order to determine whether the IG goal would be regarded as relatively more prototypical for the *actual* SOG in the minimal goal condition compared to the maximal goal condition, we conducted an analysis of variance (ANOVA) with RIP regarding the *actual* SOG as the dependent variable and the independent between subjects factor goal type condition. A significant main effect emerged,  $F(1, 73) = 10.28, p = .002, partial \eta^2 = .13$ . This indicated that RIP was higher in the minimal goal condition ( $M = 2.25; SD = 1.59$ ) than in the maximal goal condition ( $M = 1.32; SD = 0.61$ ).

A second analysis with the *ideal* SOG as the dependent variable and goal type condition as the independent variable was calculated. The same pattern of results as in the above analysis occurred,  $F(1, 73) = 4.63, p = .035, partial \eta^2 = .06$ , indicating that ingroup projection was more pronounced in the minimal goal condition ( $M = 2.60; SD = 2.03$ ) than in the maximal goal condition ( $M = 1.74; SD = 1.23$ ).

#### *Relative Ingroup Prototypicality & Attitudes towards the Outgroup Hypothesis*

In accordance with the third central hypothesis, there was a significant correlation between RIP regarding the *actual* SOG and attitudes towards the OG,  $r_{actual} = .355, p = .001$ . The more relatively prototypical the IG was perceived to be for the *actual* SOG, the more negative were evaluation of and behavioural as well as exclusion intentions towards the OG. The same analysis was conducted with RIP regarding the *ideal* SOG, and revealed a highly significant correlation,  $r_{ideal} = .511, p < .01$ .

In order to test which RIP score is more important for the prediction of the attitudes towards the OG, we calculated a multiple regression analysis with both RIP scores as independent variables and attitudes towards the OG as the dependent variable. The analysis

showed that the RIP regarding the *ideal* SOG is the more crucial predictor of the attitudes towards the OG. Like in Study I.2, RIP regarding the *actual* SOG was not anymore a significant predictor,  $\beta_{actual} = .040$ ,  $p = .768$ , whilst the regression coefficient of RIP regarding the *ideal* SOG remained significant,  $\beta_{ideal} = .485$ ,  $p = .001$ . In line with Study I.2, this pattern of results indicates that the evaluation of other groups and the behavioural intentions towards them are more definite, depending on the representation of the *ideal* SOG.

### ***I. 3.3.3. Discussion***

The current experiment replicates the findings of the previous quasi-experimental studies, using an experimental design. The results yield evidence for the presupposition that the IG goal is perceived as relatively prototypical for both the *actual* and the *ideal* SOG. More importantly, it was shown that participants in the minimal goal mindset condition considered the IG goal as particularly prototypical for the *actual* as well as for the *ideal* SOG. However, since our manipulation check failed to be significant, these results have to be interpreted with caution. Therefore, another study is necessary to explore the efficacy of the manipulation.

In line with Study I.2, the present experiment provides evidence that the representation of the *ideal* SOG is apparently more important than the *actual* SOG for an accurate prediction of the attitudes towards the OG. It was shown that a higher RIP is related to more negative attitudes and behavioural intentions as well as exclusion tendencies towards the OG.

However, it remains necessary to replicate these findings within another intergroup context in order to enable a generalization of the findings.

### **I. 3.4. Study I.4 – Climate Change and Climate Protection**



The aim of Study I.4 was to replicate the findings from the previous studies in a new intergroup context and to provide another test of the goal type mindset manipulation. The study involved the issue of climate change and environment protection. Regarding the amount of emission reduction within the European Union, the Italians have failed to reduce the CO<sub>2</sub> emission whereas the Germans managed a reduction through the last years. The relevant groups were therefore Germans (IG), Italians (OG) and the EU (SOG); the relevant goal was “climate protection”.

### ***I. 3.4.1. Method***

#### *Design and Participants*

The experiment had one between subjects variable (Mindset: minimal vs. maximal goal orientation). Thirty seven female and seventeen male students from the University of Jena (Germany), with a mean age of 22.2 years ( $SD = 3.49$ , range: 18-33), participated in this study. It took them approximately 15 minutes to complete the experiment. The Participants were rewarded with either a breakfast-coupon or a chocolate bar.

#### *Procedure:*

Procedure and material was adjusted to the present intergroup context and the relevant issue, but was basically the same as in Study I.3. The mindset manipulation was exactly the same.

#### **Goal Type manipulation check**

Analysis was undertaken to assess whether goal type perception was measured reliably across the 3 items (Cronbach's  $\alpha = .70$ ). The average score of the items was subjected as dependent variable to an analysis of variance (ANOVA) with the independent between subjects factor goal type condition. There was a significant main effect of goal type condition,  $F(1, 53) = 3.20$ ,  $p_{(one-tailed)} = .040$ ,  $partial \eta^2 = .06$ , indicating that the manipulation was successful. Participants in the minimal goal condition ( $M = 5.80$ ,  $SD = .81$ ) perceived the IG goal as a minimal goal rather more than did participants in the maximal goal condition ( $M = 5.36$ ,  $SD = 1.00$ ).

#### **Relative Ingroup Prototypicality**

Similarly to Studies I.2 and 3, two different RIP scores were calculated; the first included the perceived *actual* goal position of the SOG (RIP regarding the *actual* SOG) and the second included the *ideal* goal position (RIP regarding the *ideal* SOG).

#### **Attitudes towards the Outgroup**

In line with previous studies, attitudes towards the OG were assessed by several items addressing a broad range of issues. A 7-item scale was used, including OG evaluation (e.g., "I disapprove of Italy with regard to its goal position.."), behaviour (e.g., "One should stay away from Italy") and exclusion (e.g., "Italy should not be part of the European Union."). A factor analysis revealed a strong first factor (eigenvalue: 3.1), explaining 45% of the variance, on

which the 7 items loaded greater than .22. We treated all items as indicators of a general concept of attitudes towards the OG (Cronbach's  $\alpha = .78$ ).

### ***I. 3.4.2. Results***

#### *Preliminary Analyses: Ingroup Projection*

We predicted that Germany would be perceived as more prototypical than Italy for the *actual* and also for the *ideal* SOG (EU) with regard to the issue of climate protection. As in Study I.3, we separately analyzed if the RIP scores regarding *actual* and *ideal* SOG were above the value of 1, indicating a more relative agreement among IG and SOG. The analyses yielded significant effects,  $t_{actualRIP}(53) = 4.97, p < .001$ ;  $t_{idealRIP}(53) = 5.43, p < .001$ . Thus, the IG goal was considered as more prototypical than the OG goal for the *actual* and for the *ideal* SOG.

#### *Goal Type Hypothesis*

The analysis of variance (ANOVA) with the RIP regarding the *actual* SOG as the dependent variable and the independent between subjects factor goal type condition, yielded a marginal significant main effect,  $F(1, 53) = 3.92, p = .053, partial \eta^2 = .07$ . RIP regarding the *actual* SOG was higher in the minimal goal condition ( $M = 2.20$ ;  $SD = 1.61$ ) than in the maximal goal condition ( $M = 1.53$ ;  $SD = 0.74$ ).

We conducted a second analysis with regard to the *ideal* SOG. The same pattern of results emerged,  $F(1, 53) = 4.60, p = .037, partial \eta^2 = .08$ , indicating that ingroup projection was heightened in the minimal goal condition ( $M = 2.33$ ;  $SD = 1.62$ ) more than in the maximal goal condition ( $M = 1.59$ ;  $SD = 0.74$ ).

#### *Relative Ingroup Prototypicality & Attitudes towards the Outgroup*

The analyses of Study I.4 yielded the same pattern of results as Study I.3. Since we had clearly directional predictions, hypotheses were tested one-tailed. Both RIP scores were related to the attitudes towards the OG,  $r_{actual} = .213, p = .061$ ;  $r_{ideal} = .287, p = .018$ . The more prototypical the IG was generally perceived to be, the more negative were evaluations of, and behavioural intentions towards the OG.

Furthermore, a multiple regression analysis with both RIP measures as independent variables and the attitudes towards the OG as the dependent variable, showed that RIP

regarding the *ideal* SOG, rather than actual SOG, is the more crucial predictor of attitudes towards the OG,  $\beta_{actual} = -.789, p = .095$ ;  $\beta_{ideal} = 1.044, p = .029$ .

### ***I. 3.4.3. Discussion***

Study I.4 revealed the same pattern of results as the previous studies and thus substantiates the stability of these findings. More precisely, the experiment provides further evidence that IG goals are projected onto the SOG, and that participants with a minimal goal mindset perceive the IG goal as more prototypical for the *actual*, as well as for the *ideal* representation of the SOG in comparison to participants with a maximal goal mindset. In Study I.4, our goal type manipulation was shown to be effective. Therefore, one might draw the conclusion that it is indeed the type of the goal, which is responsible for the findings above.

The present experiment also confirmed that there is a strong relation between RIP and the attitudes towards the OG. Furthermore, it was also confirmed by replication, that the representation of the *ideal* SOG is of more importance than those of the *actual* SOG for the prediction of attitudes towards the OG.

## **I. 4. General Discussion**

### ***Ingroup Goal Projection and Goal Type***

The research presented herein aims at explaining conditions of explicit negative treatment of other groups by extending ingroup projection to IG goals; specifically to the type of goals.

In the recent past it has often been empirically confirmed that members of a group perceive the descriptive features (e.g. attributes) of their IG as more prototypical for the SOG than the features of the OG, which in turn legitimizes a less positive OG treatment (e.g. Waldzus et al., 2005; Wenzel et al., 2003). The current research makes important contributions to the ingroup projection model by providing empirical evidence for the application of ingroup projection on IG goals and by distinguishing two specific kinds of goals. The present work clearly demonstrates that the type of goal influences the degree of ingroup projection. Four studies showed that IG goals are projected to the SOG and thus are perceived as being relatively prototypical. Making the distinction in minimal and maximal goals, the different studies provide evidence that minimal goals, defined by an either-or

structure, are of particular importance regarding goal projection, and hence also for evaluations as well as the treatment of OGs.

In terms of the two quasi-experimental studies, a more pronounced projection of minimal IG goals was found; when – aside to the IG's goal position – the IG goal type was also projected onto the SOG goal type resulting in a congruence of IG and SOG goal type. Thus, when the goal type of IG and SOG were both represented as minimal goals, RIP is highest, indicating that the IG goal is mostly prototypical. In addition, the studies provide stable empirical evidence that there is a congruence of the goal types of IG and SOG, illustrating that the type of goal is also projected onto the SOG.

Two of the reported studies included a manipulation of the goal type. On behalf of these two experimental studies we could confirm that ingroup projection differs according to the goal type. In both studies participants with a minimal goal mindset perceived the IG goal as more relatively prototypical for the representation of the actual SOG compared to the maximal goal condition. Similarly, participants with a minimal goal orientation also perceived the IG goals to be more relatively prototypical for the ideal SOG; projection to the ideal SOG is discussed below in section: *Ingroup Projection and the Representation of an ideal SOG*

Drawing these findings together, it is probable to conclude that the type of goal does indeed play an important role in the interplay between ingroup projection and the judgment of different groups. The stability of these effects across quasi-experimental as well as experimental studies, and across several different intergroup contexts, allows to extend this finding to other research areas and to draw conclusions for further research. The consideration of the goal type offers insight with regard to the complex processes that occur in terms of group judgement. However, according to the present studies, the additional information provided by the type of the goal proves to be a crucial factor within the comparison of groups, and thus should definitely receive attention in future research.

#### *Group Goals and Relative Ingroup Prototypicality*

The current research provides evidence that analogously to IG attributes, IG goals are projected to the prototype of the SOG; group members perceive the IG goal as relatively prototypical for the SOG. According to the present results and previous research both IG attributes as well as IG goals appear to be projected in a similar manner. However, aside to attributes, the consideration of group goals provides additional important implications for the evaluation of groups. Group goals appear to be essential for judgments and decisions, because they serve as evaluative and behavioural guidelines supporting the stability and existence of

the group, which in turn guarantees its appropriate functioning (Breuer, Gorny, Kittler, Krüger, & Lüning, 1972; Lahti & Weinstein, 2005).

Moreover, the representation of explicit directives, such as group goals, might serve the need for uncertainty reduction, probably more than do descriptive attributes (see Hogg & Abrams, 1993). They might do so for two reasons. In the first instance, group goals provide their members with knowledge, which specific goals are to be met and how to act and react in order to reach these goals. Secondly, knowledge concerning the goals and motivations of one's own group and other comparison groups enables a more accurate evaluation of the relevant groups. More than descriptive attributes, goals are linked to decisional processes and the perception of intention, because most behaviour is preceded by an intention which is usually determined by desired goals (see Ajzen, 1985). Thus, a "strong" OG implies a threat to the IG when this respective OG is perceived as having an intention to claim its superiority. Conversely, an OG striving for a goal contrary to the IG's goal will invariably be perceived as threatening. Moreover, contradicting goals imply a negative interdependence as long as these goals remain relevant. In this case the OG might be perceived as having enduring negative intentions towards the IG. According to Jones and Davis (1965) perceptions of intentions are connected to the attribution of responsibility. In line with that, it was shown that the attribution of intentions regarding non desirable acts is closely linked to the assignment of responsibility and blame (e.g. Ohtsubo, 2007; Weiner, 2000; Phares & Wilson, 1972). Considering the link of goals and intention attributions, the representation of group prototypes in terms of goals appears to be essential for the prediction and explanation of evaluative and behavioural responses in intergroup relations, especially in case of particularly negative reactions.

### *Complexity of the SOG*

An as yet unconsidered aspect is the representation of the SOG in terms of complexity with regard to goal projection and the goal type. Recent studies have shown that a more complex representation is connected to less ingroup projection, and thus better evaluations of the OG (e.g. Waldzus et al., 2005). Now one could question whether complexity makes a difference with regard to goal projection and the goal type. Derived from the theoretical implications of the structure of minimal goals, it is likely that the projection of minimal goals will be independent of the complexity of the SOG, whereas the projection of maximal goals would likely be influenced by complexity. A more complex representation of the SOG is



expected to be linked to less projection in the case of a maximal goal. In sum, further research including the type of goal is clearly needed.

### *Ingroup Projection and the Representation of an ideal SOG*

Three of the presented studies additionally analyzed ingroup projection with regard to the *ideal* representation of the SOG. This consideration shed new light on the process of ingroup projection. Primarily, RIP is observed to be higher with regard to the *ideal* SOG compared to the *actual* SOG. This is possibly due to the lower reality constraints which are assumed to limit ingroup projection. Perspective divergence regarding the *ideal* SOG was more definite, indicated by greater effect sizes compared to the *actual* SOG (see Study I.2). Following this, participants perceived their IG goal as particularly prototypical regarding the *ideal* SOG.

Secondly, results of the quasi-experimental, as well as the experimental studies both showed that participants with a minimal goal representation considered the IG goal as particularly prototypical for the *ideal* SOG as compared to participants with a maximal goal representation.

Moreover, it could be seen that RIP regarding the *ideal* SOG is a particularly strong predictor regarding attitudes towards the OG (see section: *Relative Ingroup Prototypicality and Attitudes towards the OG*).

The distinction between actual and ideal goal representations appears to be important because of another theoretical incitement, which is the following. Group attributes as well as actual group goals are predominantly considered as descriptive features of groups. However, descriptive representations might also have a prescriptive and normative character (McGarty & Turner (1992). For example, if group members expect a prototype of their group to have specific attributes or goals, these features are not only descriptive but also prescriptive for its members. To clearly disentangle both descriptive and prescriptive group features, it appears to be useful to distinguish between actual and ideal goals. In case of an actual goal it is not completely clear whether this goal merely represents a description of the actual status quo or serves also as a prescriptive standard. However, in case of ideal goals it is relatively obvious that these goals are expected to be followed by the group members and therefore ideal goals can be regarded as prescriptive. Following this, if an IG goal is perceived as being prototypical for the ideal SOG a deviation of the OG from this normative standard legitimizes more negative attitudes towards the OG.

Altogether, there is obviously a difference between the *actual* representation of a relevant SOG and the representation referring to an *ideal* that one has towards this SOG. Much work is now deemed to be needed regarding this until now unconsidered distinction. We would therefore encourage researchers to replicate and extend these findings, especially with regard to this differentiation of the SOG.

#### *Relative Ingroup Prototypicality and Attitudes towards the Outgroup*

We also focused on the relation between RIP referring to IG goals and attitudes towards the OG, because goals and especially the types of goals were expected to be of particular importance for the evaluation of other groups. Several studies (e.g. Waldzus et al. 2005; Wenzel et al., 2003; Weber et al., 2002) have already reported a connection between RIP and OG attitudes; that is to say that a more prototypical perception of IG attributes is correlating with more negative evaluations of, and behaviours towards the OG. In line with former studies, and as an important extension of these, the present studies investigating the RIP of IG goals yield similar results. Group members that perceived the IG goal as particularly prototypical for the *actual* as well as for the *ideal* SOG reported more negative attitudes towards the OG. Additionally, high RIP was also related to a growing wish to exclude the OG from the SOG.

The distinction of RIP regarding the *actual* and *ideal* SOG allowed us to examine which representation of the SOG is more important regarding the prediction of attitudes towards the OG. Following this distinction, the present research provides instructive results. First, it is to be seen that both types of RIP are similarly related to attitudes towards the OG. Secondly, and more importantly, the results showed that the OG is predominantly evaluated according to the *ideal* SOG.

Following this, the *ideal* representation of the SOG instead of the *actual* SOG provides the comparison dimensions and background against which IG and OG are considered. With regard to this finding the following explanations emerged. Since ingroup projection is especially strong in case of the *ideal* SOG because of the lower reality constraints (see section *Ingroup Goal projection and Goal Type*), participants are probably convinced of making a more accurate OG evaluation, judging the OG in light of a less influenceable representation of an ideal. Obviously this ideal provides IG members with stable criteria against which the OG can be judged. Another possibility is that since the *ideal* SOG provides more freedom to project, perceiving the IG as particularly prototypical might represent the motivation or the

wish to project IG features. Following this, attitudes towards other groups based on the representation of the *ideal* SOG would more strongly depend on the features of the IG.

Taken all the above considerations into account, making a distinction between RIP regarding the *actual* SOG and RIP regarding the *ideal* SOG is definitely of particular importance for the understanding of intergroup relations and judgements of OGs. However, more research attention to this complex interplay of RIP with regard to goals and the attitudes towards other groups is clearly warranted.

### *Practical Implications & Outlook*

We want to conclude Chapter I by pointing out an important practical implication of our research. According to our results, attitudes towards an OG are more strongly depending on the perceived deviation of the OG from the representation of the *ideal* SOG compared to the respective *actual* representation. Thus, these findings might help to explain, why attempts to modify the attitudes towards an OG by manipulating the representation of the *actual* SOG often remain unsuccessful; there might be an *ideal* representation SOG, serving as an implicit standard that guides the evaluation of subgroups. Following this, aside to the inherent difficulties of practical interventions, the induction of changes becomes especially complicated, because an individual's representation of ideal standards have been observed to be relatively stable and similar to higher order goals not easily to be influenced (Austin & Vancouver, 1996). Furthermore, representations of ideals are de facto far more independent of reality constraints than are representations of the actual representation of categories. At least, it makes sense that stable ideals functioning as guidelines while evaluating different subgroups are a more reliable alternative than using a changeable actual norm as frame of reference.

One last remark to be mentioned regarding the goal type is pointing on the definition of minimal goals (see Brendl & Higgins, 1996) and the implied functions of these special kinds of group characteristics. At the very beginning it was noticed that minimal goals provide opportunities of determining the borders of categories because of their structure. Since it is known that individuals do need to employ categorization in order to effectively manage their lives and affairs (see Allport, 1954), the existence of minimal goals is likely to be extremely important. Imagine for instance that an individual is living in a new environment, knowing nothing about neighbours or any behavioural demands. This person is likely to come off best by first sticking to the basic rules (e.g. minimal goals), while discovering the fundamental criteria of members from different groups in order to get an

impression of the respective categories/groups. Following this example, and with regard to categorization and the goal type, the research of Schubert et al. (2008), based on the relational models theory (RMT, see Fiske, 2004), showed that specific minimal and maximal goals are implied by different groups, and defined by specific relationships. Taking all the above considerations into account, we conclude that the distinction of minimal and maximal goals offers important implications applicable to many fields of research, and thus should not be neglected by future research.

## **Theoretical Implications – Bridging the Gap to Chapter II**

Chapter I represents the first major part of the current dissertation focussing on the hypotheses regarding the IPM and the goal type distinction. This part provides empirical evidence for the impact of different goal types on ‘ingroup projection’. In particular, it was shown that group members having a minimal goal representation of an ingroup goal do perceive this specific goal as particularly prototypical for the superordinate group (SOG). In comparison, a maximal goal representation or orientation appears to be less strongly projected onto the SOG.

However, even though the experiments yield consistent evidence that the perceived relative ingroup prototypicality (RIP) differed in terms of the two goal types, one can not necessarily infer that ingroup features are indeed projected onto the SOG and that a minimal goal orientation does entail more ingroup projection. This inconvenience is also the case in terms of the findings from other previous studies on ‘ingroup projection’, because these studies merely measure RIP which is just a consequence of ingroup projection and not the process itself. Thus, until now, (to the author’s knowledge) no study tried to picture the dynamic nature of ingroup projection, which could be demonstrated by an alteration regarding the group representations (for example within individual’s memory) between a given point in time (before the projection) to another later point in time (after the projection). The aim of the second major part of the present work is to resolve this issue by providing supportive empirical findings based on a memory paradigm.

Additionally, since there appears to be a lack of research that directly connects basic psychological principles and the more “explicit” intergroup phenomena, the following work furnishes a more outright examination of the phenomenon ‘ingroup projection’. The research presented in the following Chapter II yields a more valid confirmation of the IPM by demonstrating on-line that ingroup projection has an impact on the recall and recognition of previously presented group-information. Deriving from previous research on schematic processing and remembering, the central assumption is that ingroup projection functions like a cognitive scheme (i.e. the IP-scheme) and therefore influences the recollection of group relevant information. In order to provide generalizable findings, the memory approach comprises different cognitive and motivational aspects that were expected to affect the process of ingroup projection, assessable by means of the memory performance.

## Chapter II

### Ingroup Projection and Memory

*“Memory is deceptive  
because it is coloured by today's events.”*

Albert Einstein (1879 – 1955)

#### II. 1. Introduction

Social discrimination has been and still is an important issue. This is mirrored in social psychology research (Brewer & Brown, 1998). The magnitude of this topic ranges from the relatively explicit research on intergroup behaviour, over the investigation of the perception of different groups and even to the broad field of social cognition, because the cognitive antecedents are supposed to be underlying reasons for discriminatory behaviour. The basic purpose of the present research is to connect the different approaches by acquiring evidence for one prominent model of intergroup relations — the ingroup projection model — using a paradigm developed on the basis of previous research on social information processing.

##### *II. 1.1. The Ingroup Projection Model and Previous Research*

In order to explain intergroup relations and to determine antecedents as well as processes of intergroup discrimination Mummendey and Wenzel (1999) developed the Ingroup Projection Model (IPM). Based on Social Identity Theory (Tajfel & Turner, 1979) and Self-categorization Theory (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987), Mummendey and Wenzel (1999) assumed that group comparisons take place in the frame of an inclusive superordinate group which provides the relevant comparison dimensions. If the relevant superordinate group (SOG) is positively evaluated, group members tend to perceive a congruency among their ingroup and the SOG. In particular, group members tend to assign features of their ingroup (IG) onto the prototype of the SOG, especially when highly identified on both the subordinate and superordinate level. By projecting their IG's characteristics onto the superordinate ingroup, the IG becomes relatively prototypical for the positively evaluated SOG. Consequently, other groups (i.e. outgroups; OGs) are perceived as less prototypical, thus legitimising to evaluate members of an OG less positively and/or to treat them negatively.

Taking into account that members of each subgroup desire to perceive their respective group as prototypical, the two subgroups are expected to disagree on the representation of the SOG

resulting in a *perspective divergence* between the different subgroups. Through projection, both subgroups try to increase their relative social status.

Previous research has shown that IG features are indeed perceived as more relatively prototypical. Several studies confirmed that IG attributes are perceived as relatively prototypical for the SOG (e.g. Waldzus, Mummendey, Wenzel, & Böttcher, 2004; Waldzus, Mummendey, Wenzel, & Weber, 2003; Waldzus & Mummendey, 2004; Waldzus, Mummendey, & Wenzel, 2005; Wenzel, Mummendey, Weber, & Waldzus, 2003). Moreover, recent studies indicate that - analogously to attributes - the goals of the IG are also projected onto the SOG (see Chapter I). The previous research on ingroup projection did also provide evidence for the predicted relation between the relative prototypicality of the IG and the attitudes towards a relevant OG (e.g., Waldzus et al., 2003; Waldzus & Mummendey, 2004; Waldzus et al., 2005; Wenzel et al., 2003; Weber, Mummendey, & Waldzus, 2002; for a recent review see Wenzel, Mummendey, & Waldzus, 2007).

However, by now all research that was done to yield evidence for ingroup projection has been based solely on the measurement of the consequences of ingroup projection — relative ingroup prototypicality (RIP). Thereby, individuals' perception of RIP was composed by taking the actual representations of IG, OG, and SOG into account, relating these representations to one another. In fact, individuals were asked — at one specific measure time point — how they perceive the groups. Thus, it is not absolutely clear whether group members indeed transfer IG features onto the SOG at any rate. In some cases, for example it could be the other way around. More precisely, the IG could be perceived as relatively prototypical because features from the SOG were projected to the IG. The other major problem one has to rule out is that participants responded only in the way proposed by the ingroup projection model because they were asked to do so. It could be possible that — at the specific measure time point — post-hoc answers were generated by the participants and would not naturally occur.

Thus, in a strict sense projection from the ingroup to the superordinate group has not been demonstrated yet, because ingroup projection is by definition a process. Following this, it is deemed necessary and more appropriate to demonstrate this process by means of an on-line and less direct measurement. Moreover, it is possible to investigate the stability and the implicitness of the ingroup projection process by using an indirect measure that undermines participants' ability to consciously influence the results. Besides and especially with regard to social-cognition research, it appears interesting to explore whether ingroup projection reaches far enough to have the potential to cause perceptual- and memory distortions.

Preliminary evidence for the hypothesized biased perception and memory is provided by research on the *false consensus effect* (FCE; see Ross, Greene, & House, 1977). The process of ingroup projection appears to be the group-level equivalent of the FCE (Marks & Miller, 1987), since for both the FCE as well as for the IPM similar explanations are proposed, pointing on individuals' need for social support, self-esteem, and validation of views. Various studies on the FCE indicate that individuals generalize their opinion onto their IG or that individuals perceive more similarities among themselves and their IG compared to an OG (Holtz & Miller; 1985, Allen & Wilder, 1979; Wilder, 1984). In terms of the underlying conditions and processes of the FCE, it is argued that on the one hand, the specific focus of attention is determined by individuals preferred position leading to a "selective exposure". On the other hand, it is assumed that particular information regarding individuals' own opinion is more readily available from memory, which in turn increases the possibility to attribute this information to a favourable IG (see for an overview Marks & Miller, 1987). Taken together and according to findings and underlying assumptions of the FCE-research, it appears promising to investigate whether the process of ingroup projection as hypothesized by Mummendey and Wenzel (1999) can be found regarding individuals' perception and memory.

### ***II. 1.2. The Impact of Cognitive Schemata on Information Processing and Memory***

In attempting to make sense of our social world and because we want to know what to expect — and specifically from whom to expect it — we use several, available mental tools to construct and simplify our perception, information processing and recollection of social information (Lippmann, 1922; Macrae & Bodenhausen, 2000; Macrae & Bodenhausen, 2001). In other words, the application of social categorizations, stereotyping and the usage of cognitive schemas render the world a meaningful, orderly, and predictable place and this in turn serves individuals' need for uncertainty reduction (Hogg & Abrams, 1993). As Allport (1954) already noted, the human mind is thinking with the aid of categories and one cannot possibly avoid this process. Moreover, individuals simplify the social perception and recollection by applying knowledge structures like stereotypes and cognitive schemata (Bartlett, 1932). Especially under cognitively demanding conditions, a stereotype or a cognitive schema can be helpful to reduce complexity. For example one might fill existing gaps by replacing these lost memory traces with information that fit the stereotype or the cognitive schema (Stangor & McMillian, 1992). Aside from such advantages, schema-driven processing and remembering also imply that information is encoded and memorized in a biased manner, which in turn contributes to the perseverance of the schema (e.g., Ross,



Lepper, & Hubbard, 1975). The results of several studies indicate that cognitive schemata indeed guide information processing and simultaneously influence memory (Bartlett 1932; Brewer, & Treyns, 1981; Cantor & Mischel, 1977; Hastie, 1981; Pezdek, Whetstone, Reynolds, Askari, Dougherty, 1989; Taylor & Crocker 1981).

By now, much research has focused on the interplay between information consistency, the encoding and the recall of consistent vs. inconsistent information. However, even though there is this huge amount of studies, the current state of research is not as clear as one might expect. In general it is assumed that a schema-fitting information is expected (i.e. consistent), which therefore can be stored more fluently and serve as confirmation of the existing schema (Neisser, 1976), whereas an unexpected (i.e. inconsistent) information receives more attention because it remains to be solved. In other words, it is assumed that information inconsistent with a specific stereotype or a cognitive schema provokes a deeper processing and should therefore be remembered more thoroughly. But, if memory traces are relatively rare (because of limited cognitive capacity or because the information was presented long time ago) and individuals are then asked to recollect this information, it is highly probable that individuals do rely on well-learned stereotypes and cognitive schemata to reconstruct the information. Thus, if individuals guess by relying on their perception of familiarity, the information which is consistent receives an advantage.

Various studies and meta-analyses indicate that memory differs according to the kind of measure (Roediger & Meade, 2000; Roediger & Karpicke, 2005, Rojahn & Pettigrew, 1992, Stangor & McMillian, 1992). In particular, recall and recognition tasks — when corrected for guessing — often reveal an advantage for inconsistent information, whereas recognition measures that are not corrected for guessing show a preference for consistency (see Rojahn & Pettigrew, 1992; Stangor & McMillian, 1992). These results indicate that inconsistent information is deeply processed and therefore better remembered (e.g. Graesser, 1981, Hastie & Kumar, 1979), whereas in case of memory-reconstruction the information that is consistent with the relevant stereotype and/or cognitive schema is preferentially recognized (e.g. Bodenhausen, 1990; Bodenhausen & Lichtenstein, 1987; Hastie, 1980; Hastie, 1981; Macrae, Hewstone, & Griffith, 1993; Srull & Wyer, 1989; Stangor & Duan, 1991). However, there are lots of factors that influence individuals' memory and that determine whether stereotypical knowledge or a particular cognitive schema is used and specifically how consistent and inconsistent information is processed and remembered (for an overview see Rojahn & Pettigrew, 1992; Stangor & McMillian, 1992). To name a few, prominent factors are perceivers' cognitive capacity (Bodenhausen & Lichtenstein, 1987; Macrae,

Hewstone & Griffith, 1993; Sherman & Frost, 2000; Stangor & Duan, 1991) and motivational states (e.g. personal involvement), the time interval between information presentation and memory assessment, the modality and complexity of the stimulus material, the order of presentation, processing time, the amount and the abstractness of the to-be-processed information and the proportion of consistent to inconsistent and to irrelevant information. The current research refers to several of the above listed factors.

### ***II. 1.3. Ingroup Projection as a Cognitive Schema***

In accordance with previous research on cognitive schemata we expect that ingroup projection functions like a cognitive schema (later on we will refer to ingroup projection when using the term “IP-schema”). Thus, we assume that information associated with the SOG should be processed in a similar manner as information from the IG. Referring to the assumptions from the IPM, group members are, under certain conditions, expected to perceive congruency between the IG and the SOG. Thus, the representations of IG and SOG should be represented closely in memory and therefore the same expectations for both categories/groups should arise when confronted with new information. Specifically, information that is inconsistent with the IG-stereotype is predicted to be also perceived as inconsistent for the SOG Vice versa, information that is consistent with the OG should be perceived as unexpected (i.e., inconsistent) in case of the SOG.

However, a relevant precondition is that the IG and the OG must be represented in a stereotypical manner. That is, individuals should have specific representations of both groups implying specific expectations towards the members of these subgroups. With regard to previous research on recall, information that is inconsistent with the IG-stereotype (or respectively inconsistent with the OG-stereotype) should be remembered better than information consistent with the IG (or respectively consistent regarding the OG). Given that the same expectations (as for the IG) should arise for the SOG, information associated with the SOG that is inconsistent with the IG-stereotype (respectively consistent with an OG-stereotype) is unexpected and therefore this information should be recalled more thoroughly than information which is consistent with the IG-stereotype.

With regard to individuals’ recognition performance we expect a different pattern of results. Recognition measures are more susceptible to perceivers’ uncertainty. Therefore judgements are supposed to be based more strongly on feelings of familiarity compared to the more conscious memory measures of free/cued recall. In terms of the subgroup level,

stereotype-inconsistent information is assumed to be preferentially recognized, because this information will appeal as familiar, given that the inconsistent information is expected to provoke much more elaboration at encoding.

However, although the expectations regarding IG and SOG are assumed to be similar, recognition performance should differ in terms of SOG-information because the IG (as a subgroup) and the SOG are defined by different degrees of abstractness. In accordance with Self-categorization Theory (Turner et al., 1987), the SOG is usually defined by a higher level of abstractness and therefore, representations of the SOG are specified by more variability. On the other hand, the representations of less abstract subgroups (e.g. the IG-stereotype) are relatively narrow and therefore, deviations are less expected. Following this, information being inconsistent with the IG-stereotype is expected to imply a strong perception of inconsistency when associated with the IG and, in contrast a weaker inconsistency when associated with the SOG.

Theoretical and empirical support for these predictions can be derived from previous studies focussing on “expectancy strength” in terms of the abstractness of relevant target categories (see Fiske, 1993, Fiske & Taylor, 1991). Expectancy strength is supposed to be high when the target (or target group) is represented on behalf of a relatively narrow category which, in turn, is supposed to pursue a strong perception of inconsistency and vice versa. Preliminary empirical evidence can also be found within the broad amount of research focussing on consistency memory effects. The memory advantage of inconsistent information is more pronounced in case of targets belonging to meaningful, narrow categories like clear defined groups or individuals and less pronounced in the case of large groups (e.g. like a SOG) because of the expected higher variability (Rojahn & Pettigrew, 1992; Stangor & McMillian, 1992; Rothbart, 1981; Rothbart, Fulero, Jensen, Howard, & Birrell, 1978; Srull, Lichtenstein & Rothbart, 1985, Stern, Marrs, Millar, & Cole, 1984, Lambert, 1995). Regarding a SOG, the number of members (i.e. targets) is higher per se. Hence, processing complexity and demands increase and imply a less accurate elaboration resulting in weak memory traces (Stangor & McMillian, 1992; Bodenhausen & Lichtenstein, 1987). As a consequence, when participants are asked to recognize information of large groups, such as a SOG, they have to rely on their feelings of familiarity which are expected to be based strongly on cognitive schemata like the IP-schema.

In accordance with the above considerations, we argue that in case of the SOG, the degree of inconsistency of IG-inconsistent (e.g. OG-consistent) information is not sufficient to provoke enough attention to guarantee a deeper elaboration. Hence, we expect no

recognition advantage of this information over IG-consistent information. Instead, we assume that impressions of familiarity are stronger in case of SOG-information consistent with the IG, because this IP-schema-fitting information is supposed to be encoded more fluently and well-known. Thus, we expect a preferential recognition of IG-consistent SOG-information.

Moreover and most importantly, we expect the subgroup-stereotypes as well as ingroup projection (i.e., the IP-schema) to have an influence on individuals' memory-reconstruction (reflected on behalf of the assignment of recognized information towards the groups). Individuals are expected to use the group-stereotypes to infer information and therefore, reconstructive memory should be biased in the direction of consistency on both levels of analyses. In particular, on the subgroup-level we expect that recognized information consistent with the subgroup-stereotypes would be more often assigned to the respective subgroup than inconsistent information. On the SOG-level, as a consequence of the IP-schema, we predict that information consistent with the IG-stereotype is more likely assigned to the SOG compared to information being consistent with the OG-stereotype.

#### Overview of the Hypotheses:

Memory measure	<b>Cued Recall</b>	<i>Subgroup-level:</i> subgroup-information inconsistent with the subgroup-stereotype is recalled better than consistent information
		<i>SOG-level:</i> SOG-information inconsistent with the IG-stereotype (respectively OG-consistent) is recalled better than information consistent with the IG (respectively OG-inconsistent)
	<b>Recognition accuracy</b>	<i>Subgroup-level:</i> subgroup-information inconsistent with the subgroup-stereotype is recognized better than consistent information
		<i>SOG-level:</i> SOG-information consistent with the IG-stereotype (respectively OG-inconsistent) is recognized better than information inconsistent with the IG (respectively OG-consistent)
	<b>Recognition – Source assignment</b>	<i>Subgroup-level:</i> subgroup-information consistent with the subgroup-stereotype is more often assigned to the subgroup than inconsistent information
		<i>SOG-level:</i> SOG-information consistent with the IG-stereotype is more often assigned to the SOG than information consistent with the OG

### ***II. 1.4. Cognitive and Motivational Aspects in Information Processing and Memory***

One particularly important factor concerning information processing and memory is—as already mentioned above — cognitive capacity. In accordance with the 2-process-models of information processing like the Elaboration Likelihood Model (ELM; Petty & Cacioppo, 1981, 1984) or the Heuristic Systematic Model (HSM; Chaiken, 1980) there are two different ways to process information. On the one hand people can take the “central” or “systematic” route; that is information is elaborated in a more deeply and systematic way. On the other hand one can take the “peripheral” or “heuristic” route; in this case information is processed less accurately and well-learned knowledge structures like stereotypes and cognitive schemata guide the perception to a great extent.

The relevant conditions that determine which road is taken are individuals’ motivation (e.g., personal relevance) and the ability to process information (i.e. perceivers’ cognitive capacity). More precisely, individuals encode information in an effortful and systematic way only if they have the will and the ability to process this information correctly. Conversely, if one does not have enough cognitive capacity or the given information refers to a less relevant topic — implying no personal involvement — no deep processing will occur and information is encoded only in a peripheral way. Following this, individuals are likely to encode information from the subgroups as well as from the SOG in a peripheral manner, leading to particular strong memory effects in terms of the influence of the subgroup-stereotypes and the IP-schema, when their cognitive capacity is depleted or when their motivational state hinders an accurate processing. Thus, it appears important to investigate whether the proposed memory effects differ depending on cognitive and/or motivational factors (see below Study II.2 and 3).

In addition to the examination of cognitive and motivational aspects, a further aim of the current research is to investigate the hypothesized memory effects regarding the long-term-memory perspective, because the examination of such effects over time is particularly important in terms of ecological validity and also regarding a reliable generalization. We suggest that the proposed effects occur immediately after information presentation. They should be stable and thus expected to occur across different measure time points — especially in case of memory reconstruction. We aim to consider “real” long-term-effects and therefore it appears to be appropriate to investigate memory 3-4 weeks after information presentation. Moreover, in terms of ecological validity, participants ability to follow the presented information was hindered by using a *dichotomous listening* (Cherry, 1953) in Study II.1 and

Study II.2. Whilst participants received the relevant information on one ear, they had to ignore a background “crowd talking”-sound presented on the other ear.

Taken together, the present work examines whether ingroup projection functions like a cognitive schema, having an impact on memory as a consequence. In order to provide a more valid generalization, we investigated memory effects by using different intergroup contexts, different modalities of information presentation, two different measurement points and two kinds of memory measures. In addition, we considered cognitive as well as motivational aspects.

## II. 2. Overview of the Research of Chapter II

The purpose of the present research was to investigate individuals' memory for subgroup- and SOG-information. First, regarding subgroup-information, we wanted to replicate the findings of previous research on memory for stereotype-consistent vs. inconsistent information. Specifically, we considered the recall and recognition of subgroup-information by taking into account the consistency of the presented information with the two relevant subgroup-stereotypes — the IG- and OG-stereotype.

The second and major aim of the present research was to investigate whether individuals' memory is affected by ingroup projection. In particular, it was predicted that the recollection of SOG-information would differ according to the consistency of the information with the IG- vs. OG-stereotype. We aimed to provide evidence for the assumptions on behalf of two different memory measures — recall and recognition performance. Furthermore, we examined the stability of the effects by considering memory at two measure time points — immediately after information presentation and 3-4 weeks later.

Three studies were conducted — using a modified “Who-said-What”-paradigm — to provide evidence for the assumptions regarding the memory for subgroup- and SOG-information. Moreover, each study addressed an additional aspect which is shortly explained below.

In Study II.1 the hypotheses were tested on behalf of an intergroup design with members from two different groups. Since each subgroup is assumed to perceive itself as mostly prototypical for the SOG resulting in a perspective divergence, we expected that recall and recognition of SOG-information should be affected by participants' group membership. In particular, the memory performance shown by members from the one IG should represent the reversed pattern for members from the other IG.

The additional aim of Study II.2 was to examine whether the effects would be more pronounced when participants' capacity is depleted by a second task (i.e. cognitive load) which had to be executed while being presented with the relevant, to-be-remembered information. According to the ELM (Petty & Cacioppo, 1984, 1986) information processing is less systematic and more peripheral when cognitive resources are scarce. Thus, the influence of the subgroup-stereotypes on recall and recognition performance should be particularly high for participants with less cognitive capacity.

Study II.3 was conducted to elaborate on the influence of motivational factors on memory for subgroup- and SOG-information. We included a frustration-manipulation to investigate whether the proposed memory effects are stronger when participants were in a

frustrated mood. Moreover, to allow a reliable generalization, Study II.3 focused on a different intergroup context and information was presented by using another modality. While in Study II.1 and 2 the relevant information was presented in an auditory form, information in Study II.3 was presented visually.

### **II. 2.1. Study II.1 – The Impact of Ingroup Projection on Memory**

Study II.1 was conducted to serve two basic purposes. The initial aim was to replicate previous findings of research on memory for consistent and inconsistent information. Therefore, participants' recall and recognition of subgroup information was analyzed by taking into account the consistency of the presented information with the respective subgroup-stereotype (i.e., IG- and OG-stereotype). Our major aim, however, was to investigate whether memory is affected by ingroup projection. Specifically, it was expected that memory for SOG-information would differ in accordance with the consistency of this information with the IG-and OG-stereotype. We wanted to obtain evidence for the impact of the IP-schema on behalf of two different memory measures, recall and recognition. The following specific hypotheses were tested:

First, it was hypothesized that the *recall* of information from the subgroup (IG and OG) as well as the recall of information from the SOG would be influenced by the information's consistency with the IG- and OG-stereotype. As a replication, we wanted to confirm the recall advantage for inconsistent information on the subgroup level; subgroup information (information from IG and from OG) that is inconsistent with the respective subgroup-stereotype was expected to be recalled more often than consistent information. Extending this assumption onto the level of the SOG, we analogously expected that participants would show a preferential recall of SOG-information that is inconsistent with the respective IG-stereotype.

Secondly, we predicted that *recognition accuracy* regarding subgroup- and SOG-information would also be influenced by the consistency with the subgroup-stereotypes (IG- and OG-stereotype). Since recognition measures are known to be more subtle and susceptible to individuals' uncertainty, it was expected that participants' judgements would be based on feelings of familiarity to a great extent. Regarding the subgroup level, inconsistent information was assumed to be preferentially recognized. This information is more likely to appeal familiar, as much more attention is received at/during encoding. However, on the



SOG-level we hypothesized the reversed pattern to occur. The representation of a SOG is specified by more variability compared to the less abstract level of the subgroups. Following this rationale, a piece of information inconsistent with the IG-stereotype implies a less strong inconsistency impression on the SOG-level than on the subgroup level. The degree of inconsistency of IG-inconsistent (e.g. OG-consistent) information from the SOG might not provoke sufficient additional attention to guarantee a familiarity advantage of this information over IG-consistent SOG-information. Consequently, no preferential recognition of IG-inconsistent information should emerge. Instead, we expected that impressions of familiarity would be stronger in case of SOG-information consistent with the IG, because this IP-schema fitting information is supposed to be well known and encoded more readily. Thus, we hypothesized a preferential recognition of IG-consistent SOG-information.

Thirdly and most importantly, we assumed that the assignment of recognized information towards the subgroups and towards the SOG would be biased. On the subgroup-level we predicted that recognized information consistent with the subgroup-stereotype would be more often assigned to the respective subgroup than inconsistent information. On the SOG-level, as a consequence of the IP-schema, we expected that information consistent with the IG-stereotype was more likely assigned to SOG members compared to information being consistent with the OG-stereotype.

<b>Cued Recall</b>	<i>Subgroup-level</i>	Subgroup-consistent ↓	Subgroup-inconsistent ↑
	<i>SOG-level</i>	IG-consistent ↓	OG-consistent ↑

<b>Recognition-Accuracy</b>	<i>Subgroup-level</i>	Subgroup-consistent ↓	Subgroup-inconsistent ↑
	<i>SOG-level</i>	IG-consistent ↑	OG-consistent ↓

<b>Recognition-Source Assignment</b>	<i>Subgroup-level</i>	Subgroup-consistent ↑	Subgroup-inconsistent ↓
	<i>SOG-level</i>	IG-consistent ↑	OG-consistent ↓

Furthermore, we were interested in the stability of the hypothesized effects. Therefore, we assessed memory at a second measure time point 3-4 weeks later and analyzed the above hypotheses by considering both measure time points.

In order to increase the likelihood for a successful memory experiment, we used an intergroup context that had already demonstrated effects of ingroup projection. Thus, we chose the intergroup context introduced by Wenzel and colleagues (2003) focussing on psychology and business students as subgroups and students as the SOG. Wenzel et al. (2003) showed a perspective divergence among business and psychology students regarding their representation of students in general. Following this, we expected a perspective divergence to occur in terms of the above hypothesized memory effects. That is, the pattern of results regarding the memory measures should differ in accordance with participants' group membership.

### ***II. 2.1.1. Method***

#### *Participants*

Seventy students from the University of Jena took part in the first part of our study and sixty of them participated in both parts of the study. These fourteen<sup>2</sup> business and forty-six psychology students were included in the analyses. Mean age was 21.5 years ( $SD = 2.20$ ) and 50 participants indicated to be female and 10 to be male. Participants received course credits for participation. It took them 25 minutes to complete the first part of the study at Time 1 and 15 minutes to complete the second part of the study at Time 2.

#### *Materials*

*Communicators:* We recorded several communicators stating their personal opinion towards 2 different issues. Communicators were required to state their personal opinion ensuring that the materials would be as authentic as possible. Out of all statements we chose the ones most appropriate for our experimental design.

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<sup>2</sup> Unfortunately the number of participants studying business was relatively small because many of the participants that took part at time one did not arrive for the second measure point. However, the fourteen students taking part at both measure points were sufficient to analyze the data also because we computed repeated-measures ANOVAs including the data of both measure time points, which implies a more accurate estimation of participant's true score resulting in a narrower confidence interval.

Each statement provided a short introduction of the communicator and her/his opinion specified by her/his respective argumentation. Two of the communicators introduced themselves as psychology students, 2 as business students and the other 6 communicators only mentioned that they were students. Thus, each subgroup was represented by 2 communicators and the SOG by 6 communicators. The uneven distribution of the communicators across the subgroups vs. SOG was determined within the experimental operationalization in order to reflect that the relevant SOG is a superordinate category consisting of a higher number of members per definition, and because effects of SOG were the most novel part of the research. Gender of the communicators was counterbalanced across all groups.

*Statements:* Altogether, there were 20 statements; 10 for each issue. The two issues were selected in accordance with the context used in the study of Wenzel et al. (2003). The first issue addressed the question whether students are rather *career oriented* or *social* and the second issue was whether students are rather *sober* or *emotional*. With regard to consistency, half of the statements were consistent with the stereotype of psychology students (*social / emotional*) and the other 10 statements were consistent with the stereotype of business students (*career oriented / sober*). The statements were equally distributed across the 2 issues and across the members of the groups. Thus, within each group (psychology, business, and students in general), half of the communicators made a statement consistent and the other half inconsistent with participants' IG stereotype.

A given statement lasted about 17 seconds. In order to control for presentation length, depending on the length of the statement some seconds were added before the next statement was presented.

### *Procedure*

Participants arrived in the lab, received an informed consent and were instructed that the study consisted of 2 parts. It was explicitly told that it would be necessary to complete the second part of the study one month later. They were informed that the study referred to person perception and information processing. The computer based experiment started with several demographic questions (age, gender, major). Then, participants were asked questions regarding their personal identification with their major and regarding their representation/perception of students in general and of psychology and business students. These questions referred to two issues: namely, whether students (in general; psychology, business) are rather

*career oriented or social* and whether students are rather *sober or emotional*. Participants opinion upon these topics was assessed on behalf of 6 items, using a 7-point scale, that were termed “In my personal opinion students in general/ psychology students/ business students are rather ...” (issue 1: 1 = *career oriented*, 7 = *social*, issue 2: 1 = *sober*, 7 = *emotional*). These questions were asked in order to make sure that participants held the stereotypical impression of these groups.

In the main part of the study participants were asked to listen to the statements of the 10 communicators towards the two different issues. While the statement was presented a silhouette including the name and the group membership of the respective communicator appeared on the screen. The order of communicator presentation was randomized.

Additionally, participants’ ability to comprehend the statements was hindered by using a *dichotic listening* paradigm (Cherry, 1953). Participants were presented with the statements on the one ear, to which they should pay attention to (*shadowing*) and with distracting background sounds on the other ear. These background sounds contained a crowd talking and should display the environmental distractors of everyday life that influence information processing.

The presentation phase was followed by a 5-minute distractor task.

Afterwards, memory was assessed by means of two different memory tasks. First, there was a cued recall task. Participants were asked — via open questions — to remember and indicate the statement of each communicator. These communicators were presented by a silhouette including name and group membership. Subsequently, recognition memory was assessed by a modified “Who-said-What” paradigm (see Taylor et al., 1978). At first, participants had to decide whether the presented statement was “old” or “new”. If the statement was recognized as old, participants had to indicate which communicator it belonged to by clicking onto one of the silhouettes. In addition to the 20 original statements, there were 20 new ones (distractors). The first part of the study finished by asking for participants’ mail address, as we needed to contact them for the second part of the study.

3-4 weeks later, participants were invited for the second part of the study. Again, they were asked to execute the cued recall and the recognition task. Afterwards, participants had to rate how typical each communicator for the group of students was, to ensure that all communicators were believed to be students. Finally, participants received a debriefing sheet and were thanked for their participation.

*Pre-analyses of existing stereotype representation*

In order to ensure that our participants had the expected stereotypical picture of the two subgroups, it was analyzed whether psychology students were regarded as social/ emotional and business students as career oriented/ sober. Two repeated-measures ANOVAs revealed that psychology students ( $M = 4.85$ ,  $SD = 1.35$ ) are seen as more social than business students ( $M = 2.53$ ,  $SD = 1.23$ );  $F(1, 59) = 103.83$ ,  $p < .001$ ,  $partial \eta^2 = .64$ ) and that psychology students ( $M = 4.37$ ,  $SD = 1.40$ ) are considered as more emotional than business students ( $M = 2.68$ ,  $SD = 1.16$ );  $F(1, 59) = 53.08$ ,  $p < .001$ ,  $partial \eta^2 = .47$ ).

*Dependent Measures/ Variables*

In accordance with the different memory tests and the two measure time points, several dependent measures were calculated. Furthermore, we differentiated between two levels of analyses, the subgroup-level and the SOG-level.

*Cued Recall Measures*

Two independent raters coded the recalled statements with regard to accuracy. Correct statements were coded with 1 and incorrect ones were coded with zero. The inter-rater-reliability parameter kappa was calculated for both issues and both measure time points and revealed a high agreement (ca. 80 – 90%) among the raters (kappa ( $\kappa$ ) for Time 1: issue 1:  $\kappa = .84$ ,  $p < .001$ ; issue 2:  $\kappa = .82$ ,  $p < .001$ ; for Time 2: issue 1:  $\kappa = .90$ ,  $p < .001$ ; issue 2:  $\kappa = .81$ ,  $p < .001$ ). Analyses in the results section are based on the number of correctly recalled statements with regard to group, consistency and measure time point.

*Recognition Measures -  $d'$* 

For the analyses of memory accuracy,  $d'$  scores were computed.  $D'$  is a measure that is based on signal detection theory. This measure is calculated through the proportion of hits to false alarms and the proportion of correct rejection to losses, in order to control for guessing biases (Macmillen & Creelman, 1991).  $D'$  was separately calculated for subgroup and SOG statements depending on consistency. Thus, we computed 4  $d'$  scores for each measure time point;  $d'$  for subgroup statements (consistent & inconsistent with the subgroup stereotype) and  $d'$  for SOG statements (psychology-consistent, business-consistent).

*Recognition Measures - Source Assignment*

With regard to our main hypothesis, we wanted to analyze whether statement-assignment to the communicators was biased. Thus, we computed 2 subgroup assignment-scores for each measure time point: number of subgroup-consistent statement assignment vs. subgroup-inconsistent statement assignments. Moreover, we calculated 2 SOG assignment-scores for each measure time point: number of SOG-assignment for statements consistent with the psychology stereotype vs. consistent with business stereotype.

**II. 2.1.2. Results**

Results are presented in three parts according to the three different memory measures. Furthermore, there are two separate analyses — the first for the consideration of memory regarding the subgroup-level and the second one for the level of the SOG.

**Cued Recall:***Subgroup-Level*

It was analyzed whether the consistency of communicators' statements with the respective subgroup had an influence on the recall performance on the subgroup-level. We calculated a 2x2 repeated-measures ANOVA with time (t1 vs. t2) and consistency (sum of recalled statements consistent vs. inconsistent with subgroup) as within subject factors. The analysis revealed the expected main effect of time,  $F(1, 59) = 23.12, p < .001, \text{partial } \eta^2 = .28$ , indicating that recall performance was better at Time 1 ( $M = .72, SE^3 = .08$ ) compared to Time 2 ( $M = .30, SE = .05$ ) 3-4 weeks later. Furthermore, there was a main effect of consistency,  $F(1, 59) = 8.12, p = .006, \text{partial } \eta^2 = .12$ . Participants recalled significantly more of the statements inconsistent with communicators' subgroup ( $M = .63, SE = .08$ ), than of consistent ones ( $M = .38, SE = .06$ ). The effect of consistency was stable across both measure time points, and there were no other significant effects, all  $p_s = \text{n.s.}$

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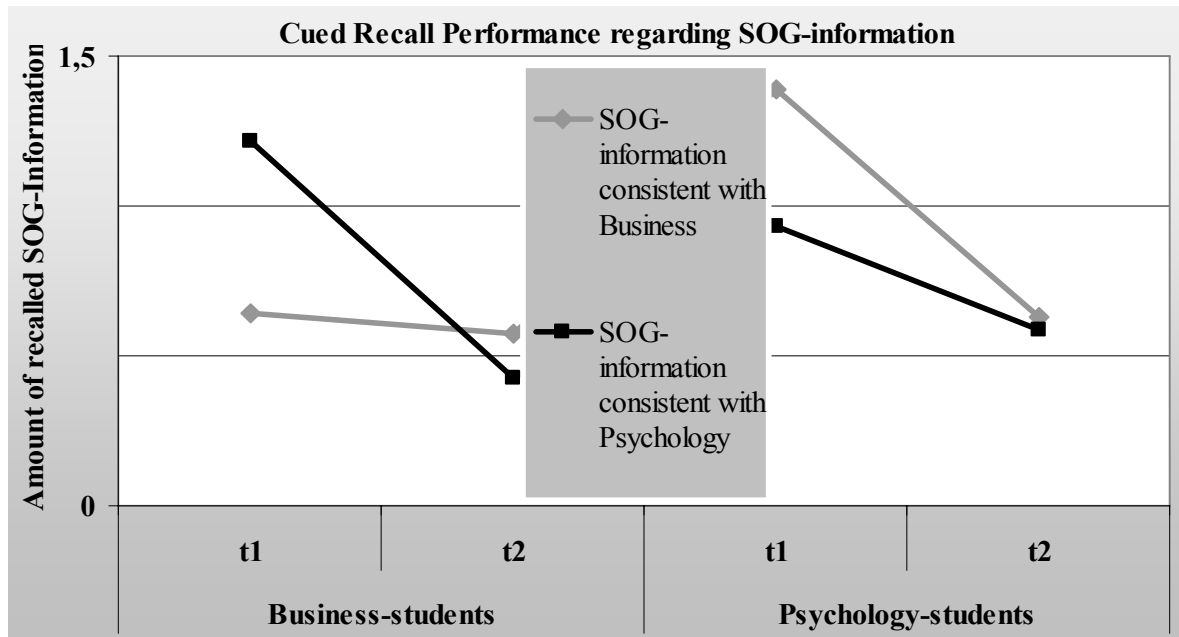
<sup>3</sup> The standard error (SE), an unbiased estimate of expected error in the sample estimate, is the sample estimate of the standard deviation (sample standard deviation) divided by the square root of the sample size (assuming statistical independence of the values in the sample).

*Superordinate Group-Level*

We wanted to test whether the recall of information from communicators belonging to the SOG was influenced by the consistency of the information with the two subgroup stereotypes (e.g. psychology- vs. business-students) depending on participants' own group-membership (psychology vs. business). Therefore, the number of correctly recalled SOG-statements consistent with the psychology-stereotype and the number of statements consistent with the business-stereotype were compared by taking into account participants' group-membership. We calculated a 2x2x2 repeated-measures ANOVA with time and consistency (consistent with psychology- vs. business-stereotype) as within subject factors and participant group (psychology vs. business) as between subject factor. The analysis revealed a main effect of time,  $F(1, 58) = 16.687, p < .001, \text{partial } \eta^2 = .22$ ; recall was better at Time 1 ( $M = 1.05, SE = .12$ ) than at Time 2 ( $M = .55, SE = .08$ ).

Additionally, a significant 3-way interaction between consistency, participant group and time was found,  $F(1, 58) = 9.42, p = .003, \text{partial } \eta^2 = .14$ . Simple comparisons showed that, in accordance with participants' group membership, recall for SOG-statements consistent with the respective OG-stereotype was better than for SOG-statements consistent with the IG-stereotype. Specifically, psychology students recalled more SOG-statements consistent with the business-stereotype than SOG-statements consistent with the psychology-stereotype and vice versa,  $F_{\text{business}}(1, 58) = 4.36, p = .041, \text{partial } \eta^2 = .070, F_{\text{psychology}}(1, 58) = 9.14, p = .004, \text{partial } \eta^2 = .14$  (see Table 4). This effect did only appear for Time 1 but not at Time 2, all  $F_s < 1, p_s = \text{n.s.}$ . Taken together, participants of both subgroups showed a preferential recall of statements that were inconsistent with their respective IG-stereotype (respectively consistent with the OG-stereotype).

However, at Time 2 no such preference for inconsistency occurs. While memory for IG-consistent information remains relatively stable, there is a loss of information being inconsistent with the IG-stereotype (see also Figure 4). There were no other significant effects, all  $p_s = \text{n.s.}$ .



Amount of recalled SOG-information		Group	M	SD	Percent
Time 1	Consistent with business-stereotype	Business	0.64	0.63	21%
		Psychology	1.39	1.02	46%
	Consistent with psychology-stereotype	Business	1.21	1.05	40%
		Psychology	0.93	0.85	31%
Time 2	Consistent with business-stereotype	Business	0.57	0.76	19%
		Psychology	0.63	0.71	21%
	Consistent with psychology-stereotype	Business	0.43	0.65	14%
		Psychology	0.59	0.81	20%

Figure & Table 4: Cued Recall Performance with regard to the SOG-information as a function of Group and Consistency and Time

### Recognition Accuracy - $d'$ :

#### *Subgroup-Level*

Similar to the above analyses, it was analyzed whether the consistency of the material had an influence on recognition accuracy regarding the subgroup-level. Therefore, we subjected the  $d'$  scores to a 2x2 repeated-measures ANOVA with time and consistency ( $d'$  for statements consistent vs. inconsistent with the subgroup-stereotype) as within subjects factors. Again, there was a main effect of time,  $F(1, 59) = 36.25, p < .001, \text{partial } \eta^2 = .38$ , indicating a better recognition accuracy for Time 1 ( $M = 1.87, SE = .05$ ) compared to time 2 ( $M = 1.55, SE$



= .05). The analysis also revealed a main effect of consistency,  $F(1, 59) = 47.26, p < .001$ ,  $\text{partial } \eta^2 = .45$ . Simple comparisons showed that recognition accuracy was better for statements inconsistent with the respective subgroup ( $M = 2.00, SE = .05$ ) than for statements given by communicators consistent with their subgroup ( $M = 1.42, SE = .07$ ). Moreover, there was an interaction of consistency and time,  $F(1, 59) = 7.366, p = .009, \text{partial } \eta^2 = .11$ , indicating that the difference in recognition accuracy between consistent and inconsistent subgroup-statements increased over time and therefore was more pronounced at Time 2 (see Table 5). There were no other significant effects, all  $F$ s = n.s..

Table 5:  $D'$  with regard to Subgroup-information as a function of Consistency and Time

Recognition Accuracy: $D'$ for Subgroup-information		M	SD
Time 1	Consistent with subgroup-stereotype	1.67	0.55
	Inconsistent with subgroup-stereotype	2.08	0.55
Time 2	Consistent with subgroup-stereotype	1.18	0.65
	Inconsistent with subgroup-stereotype	1.92	0.53

### *Superordinate Group-Level*

We tested if recognition accuracy for statements given by SOG-communicators was influenced by the consistency of the statements with the two subgroups in accordance with participants' group membership. Thus, we calculated a 2x2x2 repeated-measures ANOVA with time and consistency ( $d'$  for SOG-statements consistent with psychology- vs. business-stereotype) as within subject factors and participant group (psychology vs. business) as between subject factor. The analysis revealed the expected main effect for time,  $F(1, 58) = 46.61, p < .001, \text{partial } \eta^2 = .45$ . Participants' recognition accuracy was better at Time 1 ( $M = 2.03, SE = .07$ ) than at Time 2 ( $M = 1.44, SE = .08$ ). More importantly, there was a main effect of consistency,  $F(1, 58) = 8.14, p = .006, \text{partial } \eta^2 = .12$ , indicating that in general SOG-statements consistent with the psychology-stereotype were recognized more accurately ( $M = 1.88, SE = .08$ ) than those consistent with the business-stereotype ( $M = 1.59, SE = .08$ ). However, analyzing the data in more detail, it was shown that this difference was only significant in case of participants studying psychology;  $F(1, 58) = 15.23, p < .001, \text{partial } \eta^2 = .21$ . No difference emerged for business students,  $F(1, 58) = 1.22, p = .274, \text{partial } \eta^2 = .02$ . There were no other significant effects, all  $p$ s = n.s..

**Recognition – Source Assignment:***Subgroup-Level*

It was tested whether statements-attribution towards the two different subgroup sources (e.g. psychology and business students) was influenced by the consistency of the statements (with psychology-stereotype and business-stereotype). Hence, we compared the number of consistent statement-assignments and the number of inconsistent statement-assignments that were made in accordance with the subgroup communicators.

The 2x2 repeated-measures ANOVA with time and consistency as within subject factors revealed a less interesting main effect of time,  $F(1, 59) = 9.05, p = .004, \text{partial } \eta^2 = .13$ , which indicates that altogether more statements were assigned at Time 1 ( $M = 2.95, SE = .11$ ) than at Time 2 ( $M = 2.50, SE = .12$ ).

In line with the hypothesis, there was also a main effect of consistency,  $F(1, 59) = 9.66, p = .003, \text{partial } \eta^2 = .14$ . Simple comparisons showed that participants made more consistent statement-assignments to the subgroups ( $M = 3.13, SE = .17$ ) than inconsistent statement-assignments ( $M = 2.32, SE = .14$ ) and that this was true for both time points. There were no other significant effects, all  $ps = \text{n.s.}$

*Superordinate Group-Level*

Similar to the above analysis, we analyzed whether the assignment of recognized statements to the SOG-communicators was influenced by the consistency of these statements with the two subgroups by taking participants' group membership into account. We calculated a 2x2x2 repeated-measures ANOVA with time and consistency (number of statement-assignments to SOG-communicators that were consistent with psychology- vs. business-stereotype) as within subject factors and participant group (psychology vs. business) as between subject factor.

The analysis revealed a significant 2-way interaction of consistency and participant group,  $F(1, 58) = 7.05, p = .010, \text{partial } \eta^2 = .11$ , indicating that statement-assignments differed with regard to consistency depending on participants' group membership. According to simple comparisons, participants studying psychology assigned significantly more statements to the SOG-communicators that were consistent with the psychology-stereotype ( $M = 4.34, SE = .18$ ) than statements that were consistent with the business-stereotype ( $M = 3.56, SE = .18$ ).

Conversely, business students tended to assign more statements to the SOG that were consistent with the business-stereotype ( $M = 4.75, SE = .32$ ) and less statements that were consistent with the psychology-stereotype ( $M = 4.32, SE = .32$ ). Following this, both

participant groups assigned more statements to the SOG that were consistent with their respective IG and were less likely to assign a statement to the SOG when this statement was consistent with the OG (see Figure 5). There were no other significant effects, all  $F$ s = n.s..

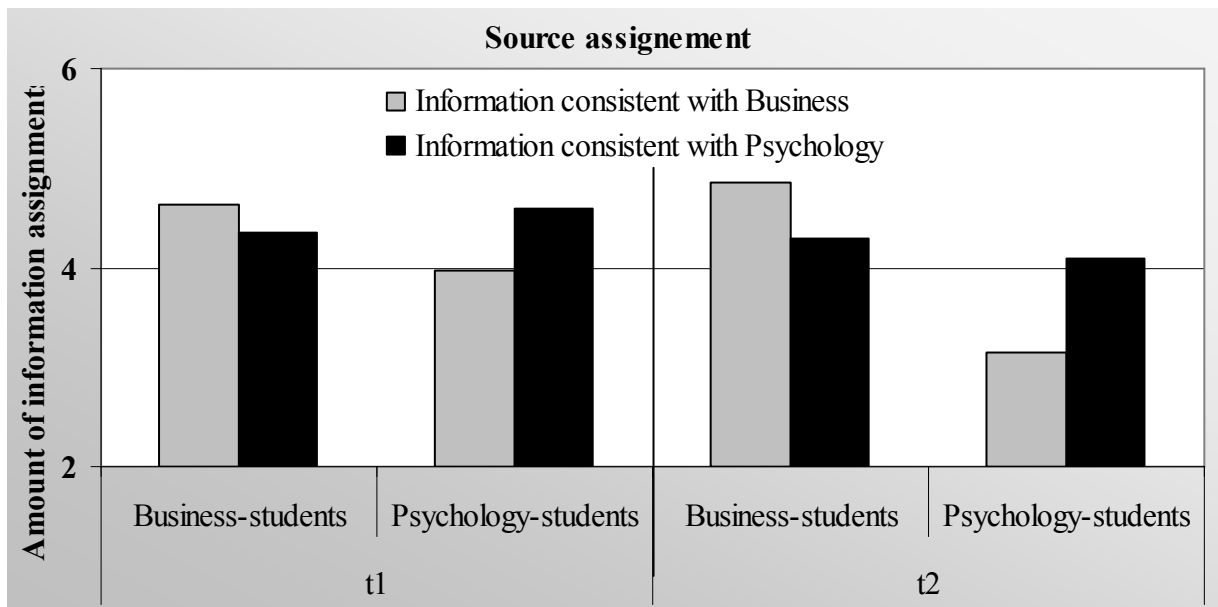


Figure 5: Assignment of the recognized information to the SOG as a function of Group and Consistency and Time

### II. 2.1.3. Discussion

The purpose of Study II.1 was to replicate findings of previous research concerning the influence of consistency on individuals' memory. In addition, and more importantly we wanted to obtain evidence for our central hypothesis stating that IP functions like a cognitive schema and therefore has an impact on memory processes. The results of participants' recall- and recognition performance do support our assumptions.

Another aim of Study II.1 was to consider two different participant groups (e.g. psychology and business students) in order to examine whether the expected perspective divergence regarding the representation of the SOG influences the memorization of SOG-information in accordance with participants' group membership. Both the results of the cued recall as well as the recognition task were affected by participants' group membership indicating that both subgroups indeed differ in their representation of the SOG. Results of both participant groups will be discussed together because participants of both subgroups were similar; regarding the SOG-level the pattern of results for psychology students was generally reversed in case of business students.

In line with previous memory research on consistency, Study II.1 replicates that subgroup-information being inconsistent with the respective subgroup-stereotype is preferentially recalled and also preferentially recognized. The inconsistency advantage indicates that unexpected information is processed more thoroughly and therefore better remembered. Moreover, the use of subgroup-stereotypes also seems to affect reconstruction-processes. That is, concerning the assignment of recognized information to the subgroups, there was a strong bias in the direction of consistency, indicating that information assignments were made on the basis of the well-known stereotypes and cognitive schemata. By assigning more stereotype consistent information to the subgroups than stereotype inconsistent, participants apparently reconstruct learned information with the help of the stereotypes. All effects concerning the subgroup-level occurred at both measure time points or even increased, indicating a temporal stability.

However, our major aim was to investigate whether ingroup projection has an influence on memory like a cognitive schema, which was analyzed on behalf of participants' recall and recognition performance. The experiment revealed that at Time 1, participants showed a recall advantage for information from the SOG inconsistent with the IG-stereotype (or to say consistent with the OG-stereotype). This indicates that SOG-information inconsistent with participants IG-stereotype apparently receives more attention at encoding and is processed more deeply because this kind of information is unexpected. Since an assumption of IP is that the SOG is represented in a way similar to the IG, this result provides evidence for the IPM. However, the preferential recall of IG-inconsistent SOG-information was only true for the first measure time point, which was probably due to the very few memory traces at Time 2. As mentioned above, it is assumed that the impression of "inconsistency" is less strong for larger, more abstract categories implying more variability. Following this, the advantage for IG-inconsistent SOG-information over the IG-consistent ones might be not strong enough to last over time, as the perceived degree of the inconsistency is lower and therefore these memory traces probably got lost relatively fast.

Regarding the recognition performance, SOG-information consistent with participants IG-stereotype was preferentially recognized at both measure time points. In line with the IPM information of the SOG that fits the IG-stereotype might have been encoded more readily and have appeared more familiar leading to a better recognition (in contrast, IG-inconsistent or alternatively OG-consistent SOG-information apparently did not receive additional attention because the perceived degree of inconsistency was probably not sufficient to provoke this

effort, as stated above.) Though, the advantage for SOG-information consistent with the IG did only occur in case of psychology students, which is in line with the study of Wenzel et al. (2003). Wenzel et al. (2003) reported aside to the expected perspective divergence a main effect (of group/psychology) indicating that psychology students are in general perceived as more prototypical and referred to Ellemers, Van Rijswijk, Roefs and Simons (1997) accounting that social reality may constrain ingroup projection.

However, the most intriguing and relevant result with regard to the IP-schema is the biased assignment of recognized information. The experiment revealed that recognized information being consistent with participants IG-stereotype, were more preferentially assigned to the SOG compared to information consistent with the OG-stereotype. This effect was stable over time, indicating that IP is a robust phenomenon, which is used as a tool in ongoing reconstruction processes regarding the recollection of previously presented SOG-information.

Altogether, the present study provides initial evidence for the influence of ingroup projection on memory processes. However, it is necessary to replicate the above findings in order to permit a more valid generalization. A second important point is the investigation of factors that might influence individuals' memory performance. In particular, it is necessary to identify factors that determine the use of stereotypes and cognitive schemata such as the IP-schema as cognitive tools for information processing. For a broader understanding of the underlying mechanisms, it would be necessary to investigate cognitive as well as motivational aspects that might have an influence. Since research on attention and memory has often focussed on individuals' cognitive capacity, it appears obvious to test the above hypothesis by considering individuals cognitive capacity in particular.

## **II. 2.2. Study II.2 – Cognitive Factors and the IP-schema**

One major aim of Study II.2 was to replicate the findings of the first study. More importantly, we wanted to yield additional empirical evidence for the assumption that IP can be considered as a cognitive schema, having an essential influence on memory processes. The second central purpose of the present experiment was to extend the above findings by considering the influence of participants' cognitive capacity on the proposed memory processes. Previous research has often shown that the influence of stereotypes and cognitive schemata on individuals' memory depends on the amount of cognitive resources one is able to use while being presented with information (Rojahn & Pettigrew, 1992; Stangor McMillian, 1992). That is, if cognitive capacity is depleted relevant well-learned cognitive schemata and stereotypes become especially important and are used as tools for facilitating information processing and recollection. Referring to the assumptions of the ELM (Petty & Cacioppo, 1984), we also expected that individuals with less cognitive capacity would be more prone to strongly rely on relevant subgroup-stereotypes and the IP-schema as tools for processing and remembering information.

Following this, we had the same hypotheses as in Study II.1 and extended them by expecting that the effects concerning participants' recall and recognition performance are more pronounced in case of less cognitive resources.

There was a procedural change compared to Study II.1. We included a manipulation of participants' cognitive capacity using a cognitive load manipulation. Study II.2 only used one participant group (e.g. psychology students) because perspective divergence had already been shown in Study II.1. Furthermore, we had to reduce the complexity of the design as we wanted to include the additional factor cognitive load. The manipulation of cognitive load was undertaken employing an auditory-based task participants had to fulfil while simultaneously being presented with the stimulus material. We assumed a cognitive load manipulation that depletes participants' capacity throughout the whole presentation phase to be appropriate in order to investigate whether and how perceivers information processing is influenced when resources are scarce.

Like in Study II.1, we also wanted to consider the stability of the effects (especially because we included the cognitive load manipulation at Time 1) and therefore assessed memory at a second measure time point 3-4 weeks later.

### ***II. 2.2.1. Method***

#### *Design and Participants*

Fifty psychology students from the University of Jena took part in the first part of the study. The forty-four students who participated in both parts of the study were included in the analyses. Mean age was 22.1 years ( $SD = 4.04$ ); 31 female and 13 male participants received course credits and a chocolate bar for participation. The completion of the first part of the experiment took 30 minutes, while completion of the second part lasted 15 minutes.

#### *Procedure*

The procedure and stimulus material of Study II.2 were basically the same as in Study II.1. After several introductory questions focussing on participants' representation of psychology-, business-students and students in general, participants were presented with the same stimulus materials and had to execute the cued recall task and the recognition task after a short distractor task. In addition, for the manipulation of cognitive load, participants were randomly assigned to the low ( $n = 21$ ) or high ( $n = 23$ ) cognitive load condition, which differed in terms of the instruction. In the low load condition, the instruction was the same as in Study II.1. Participants were presented with the statements on the one ear, to which they should pay attention and with distracting background sounds on the other ear (*dichotic listening*). In the high load condition participants were additionally instructed to count how often a ringing-bell appeared within the background sounds during the presentation of the statements. After the presentation phase, they had to answer how often the ringing-bell did appear. The profit of this specific cognitive load manipulation was that perceivers' capacity is depleted the whole time while simultaneously listening to the relevant stimulus information. It is often the case that cognitive load manipulations step in at the very beginning of the presentation phase and therefore the depletion of perceivers' capacity does not last till the end of the information processing phase. For example, in case of the often used 8-digit-number manipulation, subjects rehearse the relevant number at the beginning of the presentation phase and once the number is learned, capacity depletion is not guaranteed anymore.

#### *Pre-analyses of existing stereotype representation*

Like in Study II.1, we analyzed whether psychology students were regarded as social/emotional and business students as career oriented/sober. As expected, the two repeated-measures ANOVAs revealed that psychology students ( $M = 4.98$ ,  $SD = 1.36$ ) are seen as more social than business students ( $M = 1.80$ ,  $SD = .56$ ),  $F(1, 43) = 216.32$ ,  $p < .001$ ,  $partial \eta^2 =$

.83, and psychology students ( $M = 4.11$ ,  $SD = 1.24$ ) are considered as more emotional than business students ( $M = 2.41$ ,  $SD = .844$ ),  $F(1, 43) = 71.24$ ,  $p < .001$ ,  $partial \eta^2 = .62$ . Thus, it can be assumed that participants have a stereotypical representation of these groups, which is a necessary precondition for the following analyses.

### *Dependent Measures / Variables*

The dependent measures were calculated in accordance with the two memory tests and the two measure time points.

### *Cued Recall Measures*

As in Study II.1, we calculated the inter-rater-reliability parameter kappa which revealed an average agreement of 75% (kappa ( $\kappa$ )  $\sim .75$ ,  $p < .05$ ). Analyses in the results section with regard to cued recall are based on the number of correct recalled statements depending on group, consistency and measure time point.

### *Recognition Measures - $d'$ & Source Assignment*

For the analyses of recognition memory, several variables were calculated in the same way as in Study II.1. These scores served as the basis for the following analyses.

### *Cognitive Load Manipulation Check*

To analyze whether our cognitive-load manipulation was successful, we calculated a repeated-measures ANOVA with  $d'$  for Time 1 and 2 as the within subjects factor and cognitive load condition as between subjects factor. The analysis revealed the expected main effect of time,  $F(1, 42) = 153.51$ ,  $p < .001$ ,  $partial \eta^2 = .79$ , indicating that recognition accuracy was better for Time 1 ( $M = 1.86$ ,  $SD = .61$ ) than for Time 2 ( $M = .88$ ,  $SD = .44$ ) a month later. Furthermore, there was a significant interaction between time and condition,  $F(1, 42) = 3.72$ ,  $p_{one-tailed} = .030$ ,  $partial \eta^2 = .08$ . Simple comparisons revealed that for Time 1, participants in the low load condition ( $M = 2.04$ ,  $SD = .64$ ) showed a better recognition accuracy than those in the high load condition ( $M = 1.70$ ,  $SD = .55$ ). No such differences occurred for Time 2, all  $p_s = n.s.$ . Thus, the manipulation was successful in case of Time 1, but had no impact on recognition performance at Time 2.



### ***II. 2.2.2. Results***

Results are presented in three parts according to the three different memory measures. As for Study II.1, there are two separate analyses — one for the subgroup-level and one for the level of the SOG.

#### **Cued Recall**

##### *Subgroup-Level*

In accordance with Study II.1, we analyzed whether the consistency of communicators' statements had an influence on the recall performance on the subgroup-level by taking into account perceivers' capacity (high vs. low load). We calculated a 2x2x2 repeated-measures ANOVA with time and consistency (sum of recalled statements consistent vs. inconsistent with subgroup) as within subject factors and cognitive load as between subjects factor. The analysis showed an expected main effect of time,  $F(1, 42) = 18.94, p < .001, \text{partial } \eta^2 = .31$ . Participants recalled more statements at Time 1 ( $M = .46, SE = .09$ ) than at Time 2 ( $M = .10, SE = .05$ ). Moreover, there was a main effect of consistency,  $F(1, 42) = 8.27, p = .006, \text{partial } \eta^2 = .16$ , indicating that participants recalled more of those statements inconsistent with the respective subgroup stereotype ( $M = .41, SE = .09$ ) compared to consistent statements ( $M = .15, SE = .05$ ). The cognitive load manipulation had no significant effects and there were no significant interactions (all  $p_s = \text{n.s.}$ ). However, because we were interested if the effect of consistency was more pronounced in the high load condition, simple comparisons were calculated. The simple comparisons showed that there was a marginally significant effect of consistency in the high load condition,  $F_{\text{highload}} = 3.68, p = .062, \text{partial } \eta^2 = .081$ , whereas in case of low load there was only a tendency,  $F_{\text{lowload}} = 2.44, p = .126, \text{partial } \eta^2 = .055$ . Nevertheless, these results should be considered with caution since there was no significant main effect or interactions with regard to the cognitive-load manipulation.

##### *Superordinate Group-Level*

We also tested whether the recall of statements from communicators belonging to the SOG was influenced by the consistency with the two subgroup stereotypes (e.g. psychology- vs. business) and differed with regard to participants' cognitive capacity (i.e., high vs. low load). We calculated a 2x2x2 repeated-measures ANOVA with time and consistency (consistent

with psychology- vs. business-stereotype) as within subject factors and cognitive load condition as between subject factor. The analysis revealed a main effect of time,  $F(1, 42) = 12.64, p = .001, \text{partial } \eta^2 = .23$ ; recall was better at Time 1 ( $M = .42, SE = .08$ ) than at Time 2 ( $M = .12, SE = .05$ ). Additionally, there was a 2-way interaction of consistency and time,  $F(1, 42) = 8.58, p = .005, \text{partial } \eta^2 = .17$ . Simple comparisons showed that at Time 1 participants recalled more SOG-statements inconsistent with the IG-stereotype ( $M = .56, SE = .11$ ) than SOG-statements being consistent with the IG ( $M = .27, SE = .09$ ). At Time 2, no such preference for inconsistency occurred. While memory for IG-consistent information remains relatively stable, there is decrease in memory performance for information inconsistent with the IG-stereotype.

There were no significant effects with regard to the load manipulation. However, a closer look at the data revealed that the effect of consistency was more pronounced in the high load condition. At Time 1 in the high load condition the effect was statistically significant at Time 1,  $F_{\text{highload}} = 5.56, p = .023, \text{partial } \eta^2 = .12$ , whereas in the low load condition it was not,  $F_{\text{lowload}} = 2.34, p = .131, \text{partial } \eta^2 = .05$ . Probably, the difference between the two conditions did not reach significance due to the fact that within all participants recall was influenced by consistency in the same direction (see Figure 6).

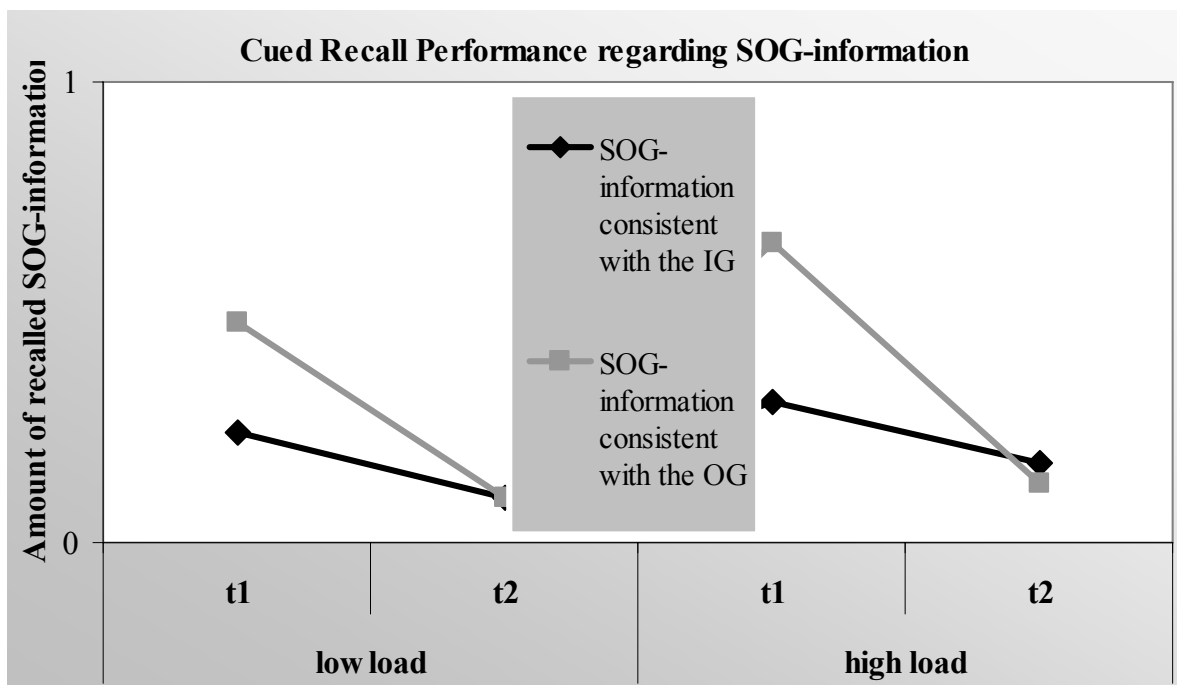


Figure 6: Cued Recall Performance with regard to the SOG-information as a function of cognitive load and consistency and time

**Recognition Accuracy -  $d'$ :***Subgroup-Level*

It was analyzed whether recognition accuracy of the subgroup-statements was influenced by consistency and differed with regard to perceivers' capacity (i.e., high vs. low load).

Therefore, we calculated a 2x2x2 repeated-measures ANOVA with the within subject factors time and consistency ( $d'$  for consistent vs. inconsistent subgroup-statements) and load condition as between subject factor. A main effect of time,  $F(1, 42) = 23.42, p < .001, \text{partial } \eta^2 = .36$ , indicated a better recognition accuracy for Time 1 ( $M = 1.88, SE = .06$ ) compared to Time 2 ( $M = 1.50, SE = .06$ ). Moreover, there was a significant interaction of time and load condition,  $F(1, 42) = 5.16, p = .028, \text{partial } \eta^2 = .11$ . At Time 1, participants in the low load condition showed better recognition accuracy ( $M = 2.00, SE = .09$ ) than participants in the high load condition ( $M = 1.76, SE = .08$ ). No difference between the two load conditions emerged for Time 2, all  $p_s = \text{n.s.}$

The analysis revealed a main effect of consistency,  $F(1, 42) = 23.75, p < .001, \text{partial } \eta^2 = .36$ , indicating that recognition accuracy was better for statements inconsistent with the respective subgroup ( $M = 2.00, SE = .05$ ) than for statements given by communicators consistent with their subgroup ( $M = 1.42, SE = .07$ ). Moreover, there was an interaction of consistency and time,  $F(1, 42) = 4.72, p = .036, \text{partial } \eta^2 = .10$ . Simple comparisons showed that the difference in recognition accuracy between consistent and inconsistent subgroup-statements was significant for both measure time points and increased over time as in Study II.1 (see Table 6). Although there was no significant interaction between consistency and load condition ( $F < 1, p = \text{n.s.}$ ), a more detailed analysis showed that at Time 1 the effect of consistency was more pronounced in the high load condition,  $F_{\text{highload}} = 4.76, p = .035, \text{partial } \eta^2 = .10$ , than in the low load condition,  $F_{\text{lowload}} < 1, p = .368, \text{partial } \eta^2 = .02$ .

Table 6:  $D'$  with regard to Subgroup-information as a function of Consistency and Time

Recognition Accuracy: $D'$ for Subgroup-information		M	SD
Time 1	Consistent with subgroup-stereotype	1.76	0.08
	Inconsistent with subgroup-stereotype	2.00	0.08
Time 2	Consistent with subgroup-stereotype	1.22	0.07
	Inconsistent with subgroup-stereotype	1.76	0.08

*Superordinate Group-Level*

Similar to Study II.1, it was analyzed whether recognition accuracy for SOG-statements consistent with the IG was better than for statements consistent with the OG while additionally taking into account perceivers' capacity (i.e., high vs. low load). In particular, it was assumed that the effect of the IP-schema would be more pronounced in case of the high load condition. We calculated a 2x2x2 repeated-measures ANOVA with the within subject factors time and consistency ( $d'$  for SOG-statements consistent with IG- vs. OG-stereotype) and the between subject factor cognitive load condition. The analysis revealed a main effect of time,  $F(1, 42) = 98.68, p < .001, \text{partial } \eta^2 = .70$ . Recognition accuracy was better at Time 1 ( $M = 1.93, SE = .07$ ) than at Time 2 ( $M = 1.19, SE = .07$ ).

Moreover, there was a main effect of consistency,  $F(1, 42) = 19.02, p < .001, \text{partial } \eta^2 = .31$ , indicating that SOG-statements consistent with the IG were recognized better ( $M = 1.74, SE = .06$ ) than those consistent with the OG ( $M = 1.38, SE = .08$ ); this effect was stable across both measure time points. A more detailed analysis revealed that the effect of consistency at Time 1 was slightly stronger in case of high load,  $F_{\text{highload}} = 9.28, p = .004, \text{partial } \eta^2 = .18$ , than in case of low load,  $F_{\text{lowload}} = 4.33, p = .044, \text{partial } \eta^2 = .09$ . The interaction between load condition and consistency did probably not reach significance ( $p = \text{n.s.}$ ) because all participants showed the effect in the same direction.

**Recognition – Source Assignment:***Subgroup-Level*

It was analyzed whether the assignment of statements towards the two subgroups (i.e., psychology (IG) and business students (OG)) differed depending on the consistency of the statement and in accordance with the cognitive load manipulation. The 2x2x2 repeated-measures ANOVA with time and consistency as within subject factors and load condition as between subjects factor revealed a main effect of consistency,  $F(1, 42) = 12.62, p = .001, \text{partial } \eta^2 = .23$ . Participants made more consistent statement-assignments to the subgroups ( $M = 3.10, SE = .21$ ) than inconsistent statement-assignments ( $M = 1.94, SE = .18$ ). This was the case for both time points indicating the stability of the effect. No significant effect was found regarding the cognitive load manipulation.

*Superordinate Group-Level*

We tested whether more of the statements consistent with the IG than OG-consistent statements were assigned to the SOG and whether the proposed biased assignment differed with regard to the two load conditions (e.g. load vs. no load). A 2x2x2 repeated-measures ANOVA with the within subject factors time and consistency (consistent with IG vs. OG) and the between subject factor load condition revealed a main effect of time,  $F(1, 42) = 31.43$ ,  $p < .001$ ,  $\text{partial } \eta^2 = .43$ . On average, participants assigned more statements at Time 1 ( $M = 4.25$ ,  $SE = .16$ ) than at Time 2 ( $M = 3.18$ ,  $SE = .15$ ).

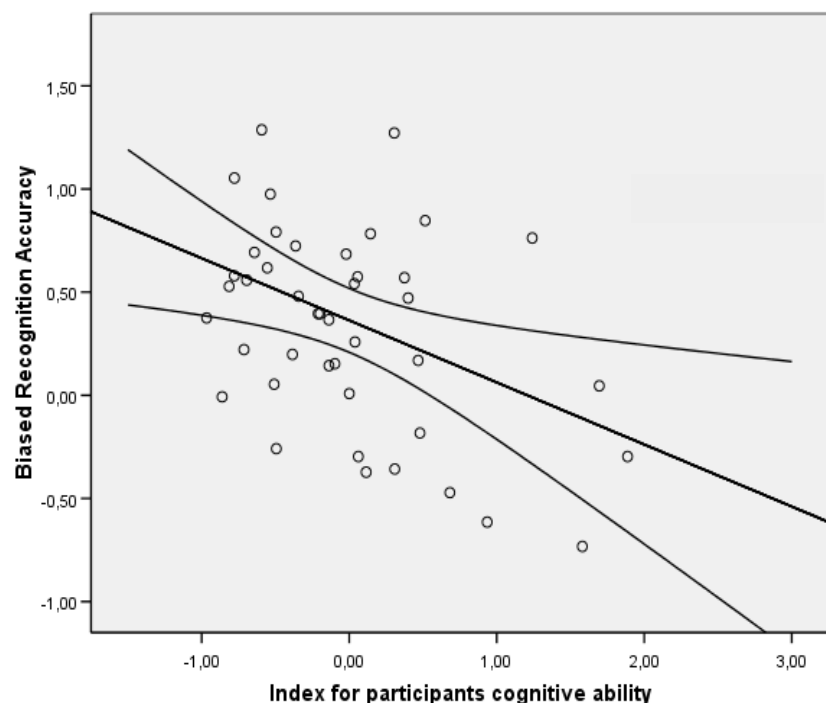
There was a main effect of consistency,  $F(1, 42) = 10.79$ ,  $p = .002$ ,  $\text{partial } \eta^2 = .20$ , indicating that participants assigned significantly more statements to the SOG that were consistent with their IG ( $M = 4.10$ ,  $SE = .17$ ) than statements that were OG-consistent ( $M = 3.33$ ,  $SE = .18$ ). The manipulation of cognitive load did not significantly influence the results.

Additional analyses were conducted to further elaborate on the hypothesis concerning the relation between processing capacity and the use of stereotypes and schemata. In order to obtain a general measure of memory accuracy, we averaged the measures of the cued recall and recognition performance from both measure time points; i.e. overall number of correct recalled statements at Time 1 and 2 and  $d'$  at Time 1 and 2 (Cronbach's  $\alpha = .63$ ).

We also calculated a measure indicating the degree of biased recognition.

Therefore, the two  $d'$  scores for IG-consistent and OG-inconsistent SOG-statements, averaged across both measure time points, were subtracted from each other.

Correlational analysis showed that participants with less memory accuracy showed more recognition bias ( $r = -.38$ ,  $p = .011$ ; see Figure 7).



*Figure 7: Biased Recognition Performance depending on Participants' cognitive ability*

### ***II. 2.2.3. Discussion***

Study II.2 replicates the findings of the first study concerning the influence of the subgroups-stereotypes and the proposed cognitive schema (i.e. the IP-schema) on the recollection of subgroup and SOG-information. Regarding the subgroup-information, the results of Study II.2 confirm the expected recall and recognition advantage for subgroup-information inconsistent with the respective subgroup-stereotype over consistent information. As explained above, the inconsistency advantage on the subgroup-level indicates that unexpected information receives more attention at encoding. The results concerning the assignment of recognized information showed that information consistent with the subgroup-stereotypes was more often attributed to members of the respective subgroup compared to stereotype-inconsistent information.

In line with Study II.1, recall and recognition of SOG-information was strongly influenced by the IP-schema confirming that ingroup projection apparently has an impact on memory processes. In particular, it was shown that at Time 1, SOG-information inconsistent with the IG-stereotype (respectively OG-consistent SOG-information) was more often recalled than IG-consistent SOG-information. As in Study II.1, no IG-inconsistency advantage appeared for Time 2, probably due to the relatively poor memory performance after 3-4 weeks.

Concerning participants' recognition performance, the results show that — at both measure time points — SOG-information consistent with the IG-stereotype was recognized more often than OG-consistent SOG-information. This finding indicates that IG-consistent SOG-information was more fluently encoded and more often recognized as familiar.

Most importantly, according to the results the IP-schema was also used for the assignment of recognized information — or so to say, for “reconstruction”. In fact, more recognized IG-consistent information was assigned to the SOG compared to OG-consistent Information.

It was assumed that the above effects would be more pronounced for participants with less cognitive capacity. The induction of cognitive load appeared to be successful. However, although detailed analyses revealed that participants under cognitive load showed stronger biases in each analysis of the recall and recognition accuracy no simple significant interaction emerged. This is probably due to the fact that the direction of the effects was the same for participants of both conditions. Two explanations for this finding are possible. First, it might be the case that the demands of the task in this experiment were already very high in the condition with low cognitive load. Hence, a strong difference between both conditions was

not possible because all participants relied in the same way on the subgroup-stereotypes and on the IP-schema for processing and remembering. A second possible explanation could be that the load manipulation was simply not strong enough.

However, there was another important indication for the assumption that the degree of memory categorization bias was depended upon the cognitive capacity. Additional analyses showed that there was a strong relation between the degree of biased recognition of SOG-information and participants' memory accuracy in general. We assume that this is related to participants' processing capacity. A worse memory performance was accompanied by stronger memory bias. Precisely, participants who recalled and recognized the previously presented information less accurately, showed a relatively worse recognition of SOG-information consistent with the OG and a relatively better memory for SOG-information consistent with the IG. In sum, the results imply that less cognitive capacity amplifies the usage of cognitive schemata, such as ingroup projection. The findings also provide support for the ELM (Petty & Cacioppo, 1984, 1986), since this model claims that peripheral processing is increased when individuals have less cognitive capacity.

Taken together, the above findings provide evidence for the influence of the IP-schema on memory. However, since Study II.2 focussed on the same intergroup context like Study II.1, it is necessary to confirm the hypotheses by means of another intergroup context. In addition, one could question whether the effects would also emerge when presenting the information in another modality but auditory, which was used for Study II.1 and 2. Thus, for a more valid generalization of the above findings, it would be important to provide further evidence by using another intergroup context and another modality for stimuli presentation. Another remaining challenge is to detect other factors that might influence the investigated memory effects. Aside to cognitive factors like cognitive capacity, individuals' actual motivation is also assumed to influence processing and should therefore determine the recollection of previously presented information. Following this, a third experiment should investigate the above hypotheses by taking into account motivational factors.

### **II. 2.3. Study II.3 – Motivational Factors and the IP-Schema**

In the first place, Study II.3 was conducted in order to replicate the findings of the two previous studies concerning the recollection of subgroup- and SOG-information. Again, our central aim was to confirm that the IP-schema has an impact on memory processes. Moreover, to further generalize our findings, we wanted to show the hypothesized effects using a

different intergroup context and additionally, another modality for the stimulus presentation. Thus, we chose an intergroup context that was already used in a study of Waldzus et al. (2003), and focussing on Germans as the IG, Italians as the OG, and Europeans as the relevant SOG. The modality used in the present experiment was visual. Precisely, the stimulus material was presented via photographs and written sentences on the computer screen.

The second central aim of Study II.3 was to further elaborate on possible variables that may influence the expected memory processes. In particular, we wanted to investigate variables supposed to increase the use of stereotypes and cognitive schemata, such as the IP-schema. According to the ELM (Petty & Cacioppo, 1984, 1986), information processing is influenced both by cognitive capacity as well as by perceivers' motivational state. For example, when presented information is of high personal relevance people are more likely to encode this information systematically and therefore memory will be more accurate. Another important factor having an impact on perceivers' motivation is the actual emotional state of the individual. For example, it has been shown that a happy mood heightens the probability to process information in a heuristic manner, whereas negative emotional states like anxiety and sadness imply more systematic processing (see for example Bless, Schwarz, & Kemmelmeier, 1996). Aside to these findings, another line of research showed that aggression, prejudice and stereotyping are more likely to emerge when individuals are frustrated and angry (see Allport, 1954; Dollard, Doob, Miller, Mowrer, & Sears, 1939). Following this, we hypothesized that frustrated individuals would process information less systematically. They were therefore expected to use stereotypes and cognitive schemata more often during processing and remembering compared to individuals under neutral conditions (who were not frustrated).

Thus, the same hypotheses as in the previous studies were tested and extended by assuming that the effects were stronger in case of individuals who were frustrated prior to the stimulus material presentation.

Even though the general experimental procedure was basically the same as in the former studies, there were some minor differences caused by the visual modality of the material and the frustration manipulation. In order to establish an adequate frustration condition, participants had to execute an additional concentration task and received a faked negative feedback at the very beginning of the experiment.

As in Study II.1 and 2, we considered the stability of the effects by assessing memory at two measure time points. In the current study, we were primarily interested whether our frustration manipulation at Time 1 would affect memory at both measure time points.



Moreover, since we were interested in participants' motivation to process the presented information, we also assessed participants' degree of identification with the IG as well as with the SOG. That enabled us to analyze whether the personal involvement had an influence on the effects.

### ***II. 2.3.1. Method***

#### *Design and sample*

Fifty students from the University of Jena took part in the study. The forty students who participated in both parts of the study were included in the analyses. Mean age of the 27 female and 13 male participants was 21.5 years ( $SD = 3.58$ ). Participants were compensated with either 3 € or course credits. The completion of the experiment took 30 minutes for the first part and 15 minutes for the second part.

#### *Materials*

The stimulus materials differed from the first two studies in terms of modality and intergroup context. In Study II.3, the whole stimulus material was presented visually and focused on the intergroup context with Germans (IG) and Italians (OG), Europeans (SOG). Material quantity (e.g. number of presented communicators and statements) was equal to the previous two studies. All 10 stimulus persons were presented via portrait photos, which were derived from other studies. Pictures were pretested in terms of nationality and neutrality of facial expression. 2 photographs showed stimulus persons clearly identifiable as Italians, 2 showed clearly identifiable Germans, and 6 pictures showed Europeans who neither looked unequivocally Italian nor German. Additionally, a flag accompanied each photograph, placed below the portrait picture, indicating the communicator's nationality (i.e. group membership).

Since we used the intergroup context of Germans, Italians, Europeans, it was necessary to choose two adequate issues. The two issues we used in Study II.3 were derived from a study by Waldzus and colleagues (2003) and focused on attributes, which were either perceived as typical of Germans (e.g. cautious and earnest) or for Italians (e.g. spirited and laxly).

The 20 communicator-statements and 20 distractor-statements were composed drawing from material of a pretest. Within this pretest the instruction focused on the question how one can recognize that a person has one of these following 4 traits: spirited, cautious, laxly, earnestly. All 4 questions were open-ended.

### *Procedure*

The procedure of Study II.3 was basically the same as in the first two studies. At first, participants were randomly assigned to the neutral mood condition ( $n = 18$ ) and the frustration ( $n = 22$ ) condition. In order to implement the respective mood, participants had to execute a concentration test at the beginning of the experiment and received a bogus/faked feedback. The concentration task was based on the d2 concentration test (Brickenkamp, 1994). Rows of letters with *ds* and *ps* with dashes above or/and below were presented to the participants who had to tick the *ds* with two dashes as fast and accurately as possible. The time per row was limited. In both conditions, participants received a faked feedback after completing 5 rows. Altogether, 15 rows had to be completed. Participants in the neutral mood condition always received the feedback that their performance did not significantly differ from the average performance, whereas participants in the frustration condition received feedback that their performance of the first 5 rows equals average, but was significantly worse than average with regard to the rows 6-15. Additionally, participants in the frustration condition were confronted with a faked breakdown of the computer-program and the experimenter telling them that they would have to execute the concentration task again after the main part of the study, because the data could not be stored.

After the frustration implementation, participants were asked to execute the main part of the experiment that followed the structure of Studies II.1 and 2. Participants were asked to indicate their IG-identification with 6 items (e.g., “I identify myself with Germany.”, “I do not consider myself as a German.”; Cronbach’s  $\alpha = .84$ ) applying a 7-point scale ranging from *1 = do not agree* to *7 = do agree*. Following this, participants had to answer questions regarding the representation of the IG, OG and SOG. In accordance with the intergroup context of Study II.3, participants’ opinion regarding the chosen two central questions (see section material) was assessed with 6 Items that were termed: “In my personal opinion Europeans/ Germans/ Italians are rather...” (issue 1: *1 = spirited*, *7 = cautious*; issue 2: *1 = laxly*, *7 = earnestly*). By assessing participants’ representation of the subgroups, we were able to analyze whether participants had the expected stereotypical impression of these groups. After the stimulus-material-presentation phase and a short distractor task, memory performance was assessed by means of the cued recall task and the recognition task. As in the previous two studies, memory was assessed 3-4 weeks later for a second time. At the second measure time point, participants were additionally asked to indicate their identification with

the SOG on 6 Items (e.g., “I identify myself with Europeans.”, “I do not consider myself as a European.”, Cronbach’s  $\alpha = .83$ ), applying a 7-point scale ranging from 1 = *do not agree* to 7 = *do agree*.

The modality of the stimulus material had an influence on the procedure for several reasons. In the presentation phase, each statement was displayed on the screen for 17 seconds, accompanied by the portrait photo of the respective stimulus person and a flag indicating the group membership. The two memory tasks — cued recall- and recognition-task — were basically the same as in Study II.1 and 2, but differed in the respect that instead of silhouettes (representing the communicators), the portrait photographs were used.

#### *Pre-analyses of existing stereotype representation*

In order to ensure that our participants had the expected stereotypical picture of the two subgroups, it was analyzed whether Italians were regarded as spirited/laxly and Germans as cautious/earnestly. Two repeated-measures ANOVAs revealed that Italians ( $M = 5.33$ ,  $SD = 1.07$ ) were perceived as more spirited/less cautious than Germans ( $M = 2.73$ ,  $SD = 1.09$ ),  $F(1, 39) = 105.88$ ,  $p < .001$ ,  $partial \eta^2 = .73$ . Furthermore, Italians ( $M = 5.15$ ,  $SD = 1.15$ ) were considered as more laxly/less earnestly than Germans ( $M = 2.00$ ,  $SD = .75$ );  $F(1, 39) = 169.91$ ,  $p < .001$ ,  $partial \eta^2 = .81$ .

#### *Dependent Measures / Variables*

Dependent measures were calculated in accordance with the two memory tests and the two measure time points.

#### *Cued Recall Measures*

The calculation of the inter-rater-reliability revealed an average agreement of 62 % (kappa  $\kappa = .62$ ,  $p < .001$ ). Analyses are based on the number of correct recalled statements depending on group, consistency and measure time point.

#### *Recognition Measures- $d'$ & Source Assignment*

For the analyses of recognition memory, several variables were calculated in the same way as in the former studies, except for the fact that for Study II.3, a different intergroup context was applied.

### **II. 2.3.2. Results**

In line with Studies II.1 and 2, results are presented in three parts.

#### **Cued Recall:**

##### *Subgroup-Level*

We analyzed whether consistency of the subgroup-statements had an influence on the recall performance with accordance to the frustration manipulation (i.e., neutral vs. frustration condition). We calculated a 2x2x2 repeated-measures ANOVA with time and consistency (sum of recalled statements consistent vs. inconsistent with subgroup) as within subject factors and frustration manipulation condition as the between subjects factor. The analysis showed a main effect of time,  $F(1, 38) = 17.46, p < .001, \text{partial } \eta^2 = .32$ . Participants recalled more statements at Time 1 ( $M = .46, SE = .09$ ) than at Time 2 ( $M = .10, SE = .04$ ). There was neither an effect of consistency nor of the frustration manipulation, which might be due to the fact that recall performance was in general very poor.

##### *Superordinate Group-Level*

It was tested whether the recall of SOG-statements was influenced by their consistency with the subgroups (i.e., Germans vs. Italians) and differed with regard to the frustration manipulation (i.e., neutral vs. frustration condition). Hence, we calculated a 2x2x2 repeated-measures ANOVA with time and consistency (consistent with IG- vs. OG-stereotype) as within subject factors and frustration manipulation condition as between subject factor. The analysis revealed a main effect of time,  $F(1, 38) = 5.97, p = .019, \text{partial } \eta^2 = .14$ . Participants recalled more statements at Time 1 ( $M = .22, SE = .06$ ) than at Time 2 ( $M = .07, SE = .04$ ). No other significant effects emerged. As in the case of the subgroup level, participants' memory performance was very poor. Probably the lack of effects is due to a bottom effect.

#### **Recognition Accuracy - d':**

##### *Subgroup-Level*

We calculated a 2x2x2 ANOVA repeated measure with the within subject factors time and consistency (d' for consistent vs. inconsistent subgroup-statements) and frustration

manipulation as between subject factor in order to analyze whether recognition accuracy for subgroup-statements was influenced by consistency and the frustration manipulation.

A main effect of time,  $F(1, 38) = 25.53, p < .001, \text{partial } \eta^2 = .40$ , indicated a better recognition accuracy for Time 1 ( $M = 1.82, SE = .08$ ) compared to Time 2 ( $M = 1.38, SE = .06$ ). The analysis also revealed a main effect of consistency,  $F(1, 38) = 10.50, p = .002, \text{partial } \eta^2 = .22$ . Recognition accuracy was better for statements inconsistent with the respective subgroup ( $M = 1.75, SE = .07$ ) than for statements consistent with the subgroup-stereotype ( $M = 1.46, SE = .07$ ). Regarding the frustration manipulation there was no significant effect.

### *Superordinate Group-Level*

We analyzed whether recognition accuracy for SOG-statements was influenced by consistency with IG and OG and the frustration manipulation (i.e., neutral vs. frustration condition). We calculated a 2x2x2 repeated-measures ANOVA with the within subject factors time and consistency ( $d'$  for SOG-statements consistent with IG- vs. OG-stereotype) and the between subject factor frustration manipulation condition. The only significant result of the analysis was a main effect for time,  $F(1, 38) = 62.32, p < .001, \text{partial } \eta^2 = .62$ , indicating that recognition accuracy was better at Time 1 ( $M = 1.45, SE = .09$ ) compared to Time 2 ( $M = .79, SE = .08$ ).

## **Recognition – Source Assignment:**

### *Subgroup-Level*

We tested whether the assignment of statements towards the subgroups (Germans and Italians) differed in accordance with the consistency of the statements and regarding the frustration manipulation (neutral vs. frustration condition).

The 2x2x2 repeated-measures ANOVA with time and consistency as within subject factors and frustration manipulation condition as between subjects factor revealed a main effect of consistency,  $F(1, 38) = 13.02, p = .001, \text{partial } \eta^2 = .26$ . Participants allocated more consistent statement-assignments to the subgroups ( $M = 2.76, SE = .22$ ) than inconsistent statement-assignments ( $M = 1.60, SE = .16$ ).

Moreover, there was a significant interaction of consistency and frustration condition,  $F(1, 38) = 4.21, p = .047, \text{partial } \eta^2 = .10$ , indicating that the effect of consistency was more pronounced in the frustration condition (see Table 7).

Table 7: Recognition – Source Assignment as a function of Condition and Consistency

Recognition - Source Assignment to the Subgroup		M	SE
Neutral	Consistent with subgroup-stereotype	2.33	0.33
	Inconsistent with subgroup-stereotype	1.83	0.24
Frustration	Consistent with subgroup-stereotype	3.18	0.30
	Inconsistent with subgroup-stereotype	1.36	0.22

*Superordinate Group-Level*

We calculated a 2x2x2 repeated-measures ANOVA with time and consistency (IG-consistent vs. OG-consistent statement assignments) as within subject factors and frustration condition as between subject factor. It was tested if the statement-assignment towards the SOG was influenced by consistency and the frustration manipulation (neutral vs. frustration condition). The results showed a main effect of time,  $F(1, 38) = 8.86, p = .005, \text{partial } \eta^2 = .19$ . More statements were assigned at Time 1 ( $M = 3.91, SE = .19$ ) than at Time 2 ( $M = 3.32, SE = .19$ ). Furthermore, there was a main effect of consistency,  $F(1, 38) = 26.69, p < .001, \text{partial } \eta^2 = .41$ , indicating that participants assigned more statements to the SOG that were consistent with the IG ( $M = 4.37, SE = .22$ ) than statements that were OG-consistent ( $M = 2.86, SE = .21$ ). The frustration manipulation did not significantly influence the results (see Figure 8).

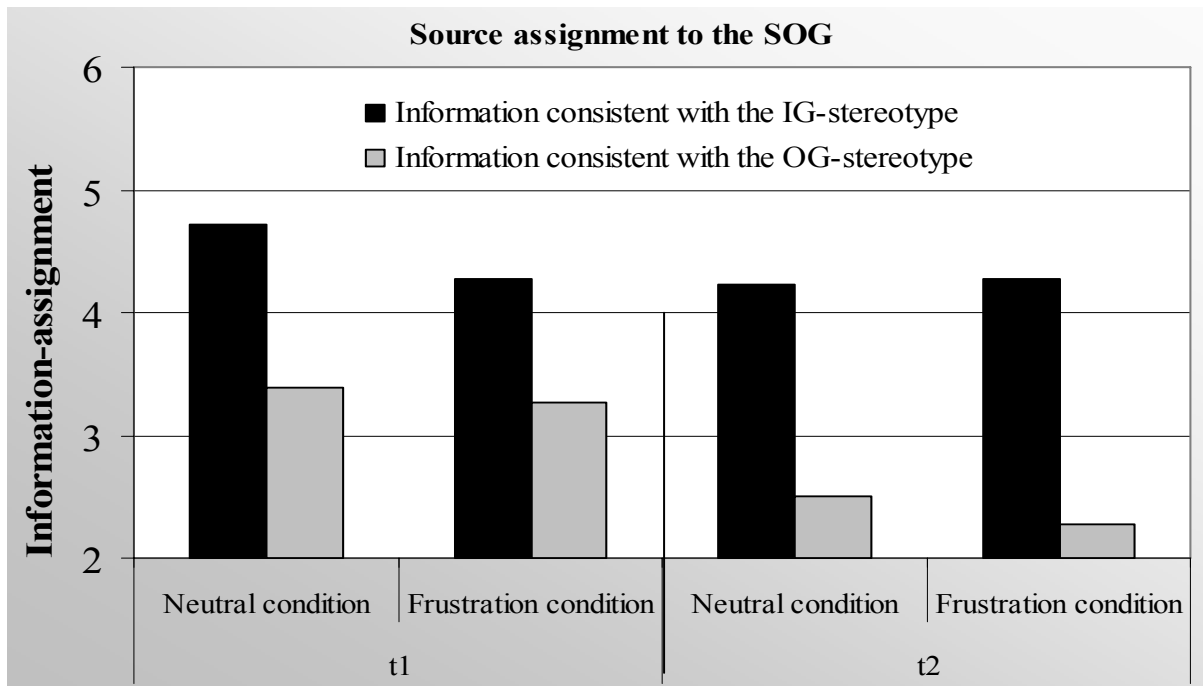


Figure 8: Recognition – Source Assignment of information to the SOG as a function of Condition, Consistency and Time

Additional analyses were conducted to further elaborate on the hypothesis concerning the relation between processing motivation and the use of cognitive schemata. In order to obtain a measure regarding general processing motivation, we computed a measure of identification with the SOG (Cronbach's  $\alpha = .83$ ) and IG-identification (Cronbach's  $\alpha = .84$ ). Both measures were averaged into a single score to obtain a measure of dual identification. As in Study II.2, we also calculated a measure indicating the degree of biased recognition. Therefore, the two  $d'$  scores for IG-consistent and OG-consistent SOG-statements were averaged across both measure time points. Correlational analyses showed that the degree of dual identification was significantly related to recognition accuracy for SOG-statements consistent with the IG ( $r = .31$ ,  $p = .05$ ; see Figure 9). There was no relationship between identification and recognition accuracy for SOG-statements consistent with the OG ( $r = .11$ ,  $p = .51$ )<sup>4</sup>. Thus, the higher participants were identified with IG and SOG, the better their recognition accuracy for SOG-statements consistent with the IG. Simultaneously, recognition performance for the statements consistent with the OG did not change.

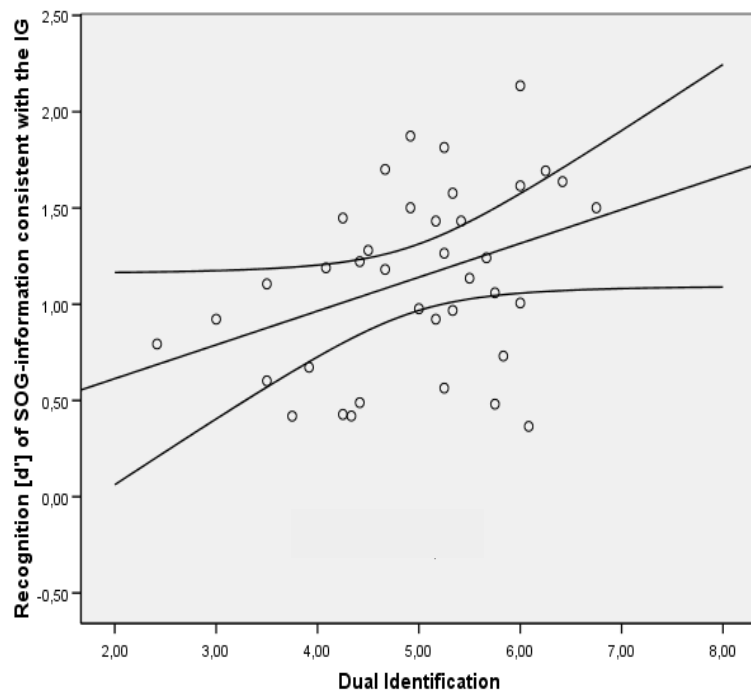


Figure 9: Recognition of SOG-information consistent with the IG depending on Participants' Dual Identification

### II. 2.3.3. Discussion

Study II.3 repeatedly confirmed that the subgroup-stereotypes as well as the IP-schema have an influence on memory. However, the results were not as clear as in the two former studies. Regarding the cued recall performance and recognition accuracy, the effects concerning the influence of the subgroup-stereotypes as well as the influence of the IP-schema failed to be significant.

<sup>4</sup> Even though only the correlational coefficient did reach significance while the other did not, the two coefficients did not significantly differ from each other.

It is possible that the task was too difficult, because participants were presented with written material and not with oral information like in Study II.1 and 2. With regard to material modality, previous research has shown that language information is generally better remembered when presented auditorily compared to visual representation (e.g. written information). For an overview regarding the modality effects see Ginns (2005). Moreover, several studies showed stronger effects concerning the differential memory for consistent and inconsistent information when information was presented in auditory form (Rojahn & Pettigrew, 1992). Future studies using visual stimulus material probably could probably show the expected effects if they provide participants with less material or more time for the encoding of the presented information, which could prevent such floor effects as reported above.

Nevertheless, aside to memory accuracy, the more relevant hypotheses we were interested in focussed on the assignment of the recognized information towards the subgroups and the SOG result. According to the results, information consistent with one of the two subgroup-stereotypes was more often assigned to the respective subgroup compared to inconsistent information assignments. Regarding the assignment of recognized information to the SOG, the following result provides evidence for the influence of the IP-schema on memory. Recognized information that was consistent with the IG-stereotype was more often assigned to the SOG than information consistent with the OG-stereotype. This finding confirms that individuals apparently use the IP-schema as a tool for the reconstruction of previously presented information. In line with Studies II.1 and 2, the use of the subgroups-stereotypes and the IP-schema for the assignment of recognized information was prevalent for both measure time points, indicating that individuals frequently rely on these cognitive tools. The present study increases the generalization of the findings from the first two studies regarding the assignment of recognized information. Even though we used a different modality for the stimulus presentation as well as another intergroup context, similar results emerged.

Another aim of Study II.3 was to investigate whether an individuals' motivational state influences the hypothesized memory processes. In particular, we expected that frustrated individuals would process information less systematically and would therefore use stereotypes and cognitive schemata more often when remembering previously presented information compared to individuals that were not frustrated (Allport, 1954; Dollard, Doob, Miller,



Mowrer, & Sears, 1939). The results showed that especially participants in the frustration condition made stereotypic information-assignments towards the subgroups. Participants in the control/neutral condition did also use the subgroup-stereotypes for information-assignments but not as often as the frustrated participant group. However, regarding the assignment of recognized information towards the SOG there was no difference among the conditions. In both conditions participants used the IP-schema for the reconstruction of the presented information in an equal manner. Probably the use of the IP-schema was less strongly affected by the frustration manipulation because frustrated participants focussed more strongly on the subgroup level.

Moreover, another explanation why the frustration vs. neutral manipulation could not have worked out properly on the SOG-level might be that both participant groups were annoyed by the prosy concentration task at the beginning of the experiment. That is, despite the frustrating vs. neutral feedback regarding the concentration performance both participant groups might have been relatively frustrated. In comparison to the former two studies, the results show particularly large effect sizes for the biased statement assignment towards the SOG. These findings indicate that the participants in the present study probably differed in the strength of the application of the IP-schema, which might be due to their motivational state. Following this, the lack of difference between the *frustrated* and the *neutral* participants might be due to the possibility that both groups were frustrated and a ceiling effect occurred in terms of the biased assignment of information towards the SOG.

However, the study provides another important finding. Because it has been shown that ingroup projection is particularly strong when group members are highly identified with both IG and SOG (*dual identification*, see Wenzel et al., 2007 for a recent review), we also assessed participants' identification with the IG as well as with the SOG. Regarding these identification measures, further analyses revealed that the degree of dual identification was positively related to recognition accuracy for SOG-information consistent with the IG-stereotype, whereas there was no relation between participants' identification and the accuracy for SOG-information consistent with the OG-stereotype. In particular, while recognition performance for OG-consistent SOG-information was not affected, recognition accuracy for SOG-information consistent with the IG was better the more participants were identified with their IG and the SOG. In line with the ELM (Petty & Cacioppo, 1986), this finding indicates that people are more likely to encode information systematically when the presented information is of high personal relevance.

Since our frustration manipulation did not have the expected clear effects on the assessed memory variables, it might be necessary to focus on other motivational factors that might have an influence on the proposed memory mechanisms. However, even though the frustration manipulation did not work out properly, the results of Study II.3 indicate that – with regard to participants' identification – individuals' motivation is indeed a relevant factor which influences the recollection of group relevant information.

## II. 2.4. General Discussion of Chapter II

The aim of the current research was to investigate whether ingroup projection can be assessed on-line in a more dynamic and indirect manner, because former studies on ingroup projection focussed solely on its consequences (i.e., RIP). However, to confirm that the ‘process’ of ingroup projection actually occurs, it appears appropriate to assess ingroup projection on-line. That is, one might consider at least two time points — one before and the other after the projection of IG features onto the SOG. Therefore, we examined individuals’ memory for subgroup- and SOG-information. In particular, we wanted to obtain evidence that ingroup projection works like a cognitive schema which influences information processing and memory. The results of three studies provide evidence for the impact of the subgroup-stereotypes (i.e., IG- and OG-stereotype) and ingroup projection (i.e., the IP-schema) on recall as well as on recognition, which is discussed in more detail below. Note that the confirmation of the influence of the subgroup-stereotypes on memory is a necessary precondition for the further analyses of the IP-schema influence on memory, because ingroup projection can only occur if there is a stereotypical representation of the subgroups.

First, regarding the recall of previously presented subgroup information, we could replicate the findings from previous research on memory for stereotype-consistent vs. inconsistent information. The studies contain evidence that subgroup-information, which is inconsistent with the respective subgroup-stereotypes is preferentially recalled across both measure time points. Following this, it is assumed that inconsistent information provokes additional attention, leading to a deeper processing, which in turn is reflected by a better recollection. With regard to the recall of SOG-information, the results of the current work provide evidence that there is a recall advantage for SOG-information that is inconsistent with the IG-stereotype (or one might also say for SOG-information which is consistent with the OG-stereotype). Following this, individuals obviously process SOG information more deeply when it is inconsistent with their IG, because this information is unexpected and leads to more attention.

Secondly, with regard to recognition performance, the present studies yield evidence that subgroup information inconsistent with the respective subgroup-stereotype is recognized more often compared to subgroup consistent information. We assume that inconsistent information appears more familiar, because it receives more attention at encoding. However, concerning the SOG-information, we predicted that the SOG-information being inconsistent with the IG-stereotype would not provoke enough attention to cause a recognition advantage

over the IG-consistent SOG-information. Since a SOG is associated with more variability the perceived degree of inconsistency is expected to be weaker compared to the equivalent inconsistency impression on the subgroup level (see Rothbart, 1981; Srull, Lichtenstein & Rothbart, 1985; Stern, Marrs, Millar, & Cole, 1984). Thus, it was expected that IG-consistent SOG-information would appear as more familiar and therefore, a recognition advantage for this information was predicted. The results show evidence for this expected recognition advantage of IG-consistent SOG-information.

Furthermore and most importantly, the results regarding the assignment of recognized information towards the groups indicate that the subgroup-stereotypes and the IP-schema are used as tools for the reconstruction of the previously presented information. As expected, participants showed a biased assignment of the information to the subgroups and the SOG across all studies at both measure time points. Specifically, more subgroup-stereotype consistent — rather than inconsistent — information was assigned towards the subgroups. Most interestingly, with regard to the SOG, more IG-consistent — rather than OG-consistent — information was assigned to the SOG. The biased assignment of the information towards the SOG provides the strongest confirmation in terms of ingroup projection, because it is assumed that cognitive schemata (such as the IP-schema) are particularly important when it comes to reconstruction processes (Bartlett, 1932). Individuals apparently use the IP-schema to infer to which group the respective information belongs. By assigning more IG-consistent — rather than OG-consistent — information to the SOG, the IG automatically becomes more relatively prototypical. In other words, as a consequence of the biased information assignment the representation of the SOG moves closer to the IG than to the OG. (Note that individuals were presented with the same number of IG-consistent and OG-consistent pieces of SOG-information at encoding.)

In Study II.1, the hypotheses were tested using an intergroup design with members from two different groups. Since members of each subgroup are assumed to perceive their IG as mostly prototypical for the SOG resulting in a perspective divergence, we expected that both recall and recognition of SOG-information would be affected by the group membership of the participants. The results of Study II.1 showed the expected perspective divergence on both the recall performance and the assignment of the recognized information. In particular, the memory effects regarding members from the one IG, was reversed for members from the other IG.

The results of Studies II.2 and 3 additionally provide evidence for the influence of cognitive and motivational factors on the application of the subgroup-stereotypes and the IP-schema. Since the use of the IP-schema appears to differ in accordance with individuals' cognitive capacity and motivation, one might draw the conclusion that ingroup projection can indeed be considered as a cognitive schema, taking into account that the application of cognitive schemata is affected by cognitive as well as motivational aspects.

#### *Cognitive Conditions and the Impact of Ingroup Projection on Memory*

The aim of Study II.2 was to examine whether the effects are more pronounced when participants' capacity is depleted by a second task (i.e., cognitive load). According to the ELM (Petty & Cacioppo, 1984, 1986), information processing is less systematic and more peripheral when cognitive resources are scarce. Our manipulation did not work out as properly as expected. Although the results showed that participants in the cognitive load condition tended to show stronger effects, these differences failed to reach significance. This might be due to the fact that both participant groups (i.e., low vs. high load) showed effects in the same direction. However, the results contain evidence that the IP-schema has more influence on recognition performance in case of individuals with less cognitive capacity. In particular, especially those individuals who had a relatively worse overall memory performance showed a strongly biased recognition in the direction proposed by the IPM. A further interesting step could be to explore the impact of cognitive load on schematic processing and memory by considering different levels of cognitive load (e.g. no load, low load, medium load, high load). Moreover, in order to gain a deeper insight into long-term memory effects, one should investigate the proposed effects using a more extensive time interval between information presentation and memory assessment (e.g., half a year).

#### *Motivational Conditions and the Impact of Ingroup Projection on Memory*

In Study II.3, we wanted to examine the influence of motivational factors on memory for subgroup- and SOG-information. Despite the fact that the frustration-manipulation did not yield the expected effects, the study contains evidence for the influence of motivational factors on the proposed memory effects. That is, detailed analyses indicate that individuals being highly identified with both their IG as well as the SOG do show a better recognition for SOG-information consistent with their IG, whereas recognition accuracy for the OG-consistent SOG appears to be unaffected by the degree of identification. However, it remains

necessary to manipulate identification to reliably claim that the degree of identification is a responsible predictor in terms of individuals' memory. Future research could also investigate if memory differs in terms of materials implying high personal involvement compared to low involvement of the participants. One might expect that in case of a less relevant topic, schematic processing is heightened because individuals are prone to use less cognitive resources.

Regarding the influence of cognitive and motivational factors, the findings indirectly provide support for the ELM (Petty & Cacioppo, 1986). According to the ELM information processing differs relative to individuals' cognitive ability and the motivational state; either resulting in a more systematic "central" processing or in a more heuristic, "peripheral" processing. The latter implies that information processing is guided by existent knowledge structures like stereotypes and schemata. The present studies also obtain evidence that the influence of stereotypical knowledge and cognitive schemata (i.e. the IP-schema) on memory depends on individuals' cognitive ability and motivation and therefore provides additional support for the assumptions of the ELM. In future research, it would be interesting to consider both cognitive and motivational factors together to gain a deeper insight into individuals' processing of information associated with IG, OG and SOG.

Taken all the above considerations of the present research together, the current work provides a deeper insight into the process of 'ingroup projection'. According to our findings, ingroup projection might indeed be regarded as a cognitive schema that has an influence on individuals' memory. Moreover, aside to the more explicit assessment of ingroup projection via the actual perception of RIP, it is possible to measure ingroup projection on-line in a more indirect manner. Thus, the current work provides particularly important empirical evidence for the IPM, because we could successfully confirm and extend the IPM.

Additionally, our research enables a sufficiently reliable generalization of the findings, because the effects were shown across different intergroup contexts, different modalities (i.e. auditory vs. visual stimulus presentation) and different measure time points. Moreover, we successfully examined the hypotheses applying two different memory measures (i.e., recall and recognition).

It appears logical to assume that the herein investigated memory effects are influenced by situational and relevant contextual conditions. Depending on a specific situation there might be different representations of the subgroups and the SOG selectively activated. Imagine, for

example, that German citizens are presented with information of Europeans in a context suggesting a comparison between Germans and Italians. In this case, it is likely that specific features of the IG (i.e., Germans) become activated that are distinct from the stereotype of Italians. Simultaneously, the same features are also activated for the representation of the SOG (i.e., Europeans) and therefore will influence information processing. However, if the context suggests a comparison against another OG, like for example Britains, other specific features become relevant and accessible, leading to the consequence that different SOG-information will be remembered (compared to the case when the OG are Italians). Preliminary evidence for this rationale can be found in a study of Wenzel and colleagues (2003). They already showed that the SOG is perceived differently depending on the context. Thus, it appears plausible to expect that the application of the IP-schema with regard to individuals' memory is influenced by the specific situation, which remains to be tested in future studies.

The present research implies important conclusions with regard to the perception of social groups and social discrimination. The “stable” tendency to favour ones IG over other social groups (i.e., OGs) and to treat members of other OGs more negatively might be explained by such basic cognitive mechanisms that were investigated in the reported studies. It is generally known that stereotypical knowledge and cognitive schemata are extremely difficult to change. However, such knowledge structures provide individuals with stable expectations regarding the social world. Taking into account that ingroup projection influences individuals' memory like other cognitive schemata one might draw the conclusion that the IP-schema has important implications for social discrimination because individuals' judgments are based on their stored knowledge to a great extent. Thus, remembering group information in a way that makes the IG relatively prototypical might legitimize an unequal evaluation and treatment of other groups. Thus, the IP-schema provides a stable basis for social discrimination.

#### *Implications for further research*

Recent research on memory and information processing has used and is still using multinomial modelling in order to analyze different memory parameters. The results of the present work were conducted by using more conventional methods of analysis. Precisely, we calculated several analyses of variance (ANOVAs). This way of dealing with the data appeared to be sufficient to shed light on our assumptions regarding ingroup projection and memory. However, it might be promising to additionally analyze the present and future data by applying multinomial modelling.

Moreover, to allow further generalization of the influence of ingroup projection on memory, it remains necessary to show the effect across different relevant group features. Because Studies II.1-3 considered predominantly IG attributes it remains to test the above assumption using stimulus material that contains another kind of group characteristics, as for example group goals.

Previous studies on ingroup projection showed that there is a strong connection between the relative prototypicality of the IG and the attitudes towards the relevant OG (e.g. Waldzus et al., 2003; Waldzus & Mummendey, 2004; Waldzus et al., 2005; Wenzel et al., 2003; Weber et. al, 2002; for a recent review see also Wenzel et al., 2007). Thus, it might be worth to investigate whether individuals' degree in using the IP-schema for remembering is related to the evaluation of the OG. It is probable that OG-attitudes are predictable through the assessment of individuals' memory. Following this, further research should consider the link between memory for group-information and attitudes towards the OG.



## Chapter III

### The Synopsis of Goal Projection & the Memory Approach

#### III. 1. Theoretical Implications and Introduction to Chapter III

The studies reported in Chapter II considered the influence of ingroup projection on memory and indicate that ingroup projection equals a cognitive schema because it is apparently used as a cognitive tool for remembering previously presented information (and therefore is referred to as the IP-schema). The presented stimulus material in Studies II.1-3 reported in Chapter II was constituted with reference to previous research on ingroup projection and focussed solely on attributes characterizing IG and OG. Altogether, most previous research on the IPM has predominantly focussed on IG attributes. However, according to the IPM (Mummendey & Wenzel, 1999), it is quite coherent to assume that other features from the IG, like IG goals, are also projected onto the SOG. In the above research (see Chapter I), it has been shown by two quasi-experimental and two experimental studies that different kinds of IG goals entail different degrees of ingroup projection, resulting in more or less RIP. In particular, it was distinguished between *minimal* and *maximal goals*, which are characterized in the following manner. *Minimal goals* are defined by a *dichotomous* either-or fashion structure implying that any behaviour which meets the minimal goal is acceptable and any other behaviour is not acceptable — irrespective of its degree, any deviation is negative. On the other hand *maximal goals* that are *gradually* structured imply a better or worse evaluation depending on the distance to a certain reference point. The four studies reported in Chapter I showed that RIP differed in accordance with these two goal types. The research confirmed that IG goals, especially those represented as a minimal goal are seen as relatively prototypical for a relevant SOG (see Chapter I). Consequently, it appears to be an important extension to combine the research considering the influence of ingroup projection on memory (reported in Chapter II) and the research investigating the impact of the different goal types on the perceived RIP. The following study aims at resolving this issue.

#### III. 1.1. Study III.1 – Ingroup Projection, Goal Type Orientation and Memory

Study III.1 was conducted to connect the findings reported in Chapter I and Chapter II. The first major aim of the present study was to replicate the findings concerning the goal type

and the more “explicit” ingroup projection measures, which were reported in Chapter I. In particular, we expected that participants with minimal goal orientation would perceive their IG goal as more relatively prototypical for the *actual* SOG than participants with a maximal goal orientation. Additionally, we predicted that this difference between minimal vs. maximal goal orientation would also hold in case of the representation of the *ideal* SOG — the goal position which the SOG should ideally claim. Furthermore, we also wanted to replicate and extend the findings regarding the relationship between RIP and attitudes towards the OG. It was assumed that *ideal* RIP would predict OG-attitudes better than *actual* RIP. We also tested whether a minimal goal orientation compared to a maximal goal orientation is related to more negative OG-attitudes and whether this relationship is mediated by RIP.

The second central aim was to extend the findings regarding the influence of ingroup projection on memory (Chapter II) by investigating the potential influence of the goal type orientation — based on the findings reported in Chapter I. Specifically, using a similar procedure as in the memory studies of Chapter II, we considered whether the pattern of results regarding the assignment of recognized information towards the subgroups and the SOG differed in accordance with the goal type orientation. The distinction of minimal and maximal goal orientation can be regarded as a cognitive factor influencing information processing and remembering. Individuals with a minimal goal orientation might consider presented information in an oversimplified dichotomous way and therefore would be prone to process and remember information in a heuristic manner; which in turn increases the probability to use stereotypes and cognitive schemata like the IP-schema. Moreover, individuals’ goal orientation might also be a motivational factor (like individuals’ emotional state or individuals’ identification) having an influence on memory, because an IG minimal goal is assumed to be especially important for the viability of a group (see Chapter I). Thus, we expected the goal type orientation to have an essential influence on memory.

The central purpose of the present study was to bring the two lines of research reported in Chapter I and II together while focussing on the main hypotheses. In order to keep track of the general aim of the present research, it was necessary to narrow down the memory analyses. To analyze the impact of the goal orientation, we decided to focus on reconstructive memory (i.e., the assignment of the recognized information). This memory measure appears to be most important because it includes recognition performance as well as concrete classification tendencies. Regarding reconstruction memory and the goal type orientation, we hypothesized that participants having a minimal goal orientation would more likely assign

recognized information in a biased, stereotypic way compared to participants with a maximal goal orientation. In particular, participants with a minimal goal orientation were assumed to use the subgroup-stereotypes and the IP-schema for the assignment of the recognized information. They should therefore assign more consistent than inconsistent information towards the subgroups as well as more IG-consistent than OG-consistent information towards the SOG.

The third and most important aim of the present study was to investigate the relation of participants' reconstructive memory bias and the more "explicit" IG projection measures (i.e., actual & ideal RIP, attitudes towards the OG). In particular, it was expected that the degree to which memory is biased would be significantly related to the *actual* RIP and especially to the *ideal* RIP. A more biased memory reconstruction was assumed to be connected to higher RIP. Furthermore, since RIP is assumed to be related to attitudes towards the OG, we also expected that more memory bias would go along with more negative OG-attitudes. As another point of interest, we considered whether the relationship between memory bias and the OG-attitudes was mediated by the more "explicit" RIP measures.

The present experiment focussed on the same groups as Study II.3 — Germans (IG), Italians (OG) and Europeans (SOG). Moreover, since we wanted to choose an appropriate intergroup- and goal-context, we decided to use the one already used in Study I.4 (see Chapter I). The results of this study successfully confirmed that the manipulated goal type orientation had an impact on the perceived RIP focussing on Germans, Italians and the goal "climate protection". Hence, "climate change and protection" was chosen as the central issue for the present experiment and German participants were asked to take part in our study. For the manipulation of the goal type orientation we chose the procedure that was already successfully used in Study I.3 and 4 (see Chapter I). Specifically, the goal type orientation was manipulated by means of an additional task based on the concentration test d2 (Brickenkamp, 1994; see procedure reported in Chapter I).

Finally, as in the studies reported in Chapter II, we included two measure time points in order to investigate the stability of the effects over time. It was expected that participants with minimal vs. maximal goal type orientation would only differ at Time 1 regarding the more "explicit" IG projection measures (i.e., *actual* and *ideal* RIP) because the goal type orientation manipulation is only present at Time 1. Consequently, participants should show

the same degree of IG projection at Time 2 when the manipulation is absent. However, regarding the memory bias, we assumed the effect of the goal type orientation to be stable over time, because the information presented at Time 1 must have been encoded under conditions of minimal vs. maximal goal orientation. Following this, recognition memory should be affected at both measure time points.

### ***III. 1.1.1. Method***

#### *Design and sample*

Sixty students from the University of Jena took part in the first part of the study. The forty students participating at both measure time points were included in the analyses. Mean age was 21.2 years ( $SD = 1.53$ ). The 31 female and 9 male participants were compensated with 3 € or a breakfast coupon. The completion of the experiment took 15 (t1) and 10 (t2) minutes.

#### *Materials*

The stimulus materials were composed in a similar way as in Study II.3. Since Study III.1 focused on the same subgroups (Germans and Italians) we could use the same picture material with regard to the stimulus persons/communicators. However, for the configuration of the statements we had to choose an issue containing a group goal, which provides a conflicting situation because of the different positions of both subgroups towards this goal. The chosen goal context focussed upon “climate change and climate protection” and the position of the above groups towards this issue. In this study it was shown that Germany was perceived as striving for climate protection, whereas Italy was not, and the German participants considered the German goal position as relatively prototypical for the SOG (the EU).

The communicator-statements and distractor-statements were composed using a pretest. Study III.1 differed from Studies II.1-3 in terms of quantity of the stimulus material, because we focused on only one issue. Hence, each communicator was connected to only one statement (instead of two as before).

#### *Procedure*

The experiment was similar to the other studies reported in Chapter II. As extension to the basic procedure, the two different goal mind sets were induced on behalf of the goal type manipulation used in Study I.3 and 4 reported in Chapter I. Participants were randomly assigned either to the minimal goal ( $n = 22$ ) or the maximal goal ( $n = 18$ ) condition. The conditions differed in terms of the instruction to a concentration test, which had to be

executed simultaneously to the basic experimental procedure. This was done to ensure the stability of the induced mindset.

After the introduction of the concentration task, we presented participants a short audio sequence from the recent news and a text passage that provided them with information about climate change and the CO<sub>2</sub> emission of Italy, Germany and the EU. In order to assess the *actual* RIP, participants then had to indicate their personal representation of the three groups regarding their position towards the issue “climate protection”. Participants’ opinion was assessed with one item for each group on a 7-point scale. It was termed: “Germans/ Italians/ Europeans strive for the following goal.... (1 = *no support of climate protection*, 7 = *strong support for climate protection*). Additionally, we assessed the *ideal* RIP based on participants’ representation regarding the goal position that the SOG ideally should strive for (see Chapter I). It was measured with the item: “Europeans ideally should strive for the following goal...” (1 = *no support of climate protection*, 7 = *strong support for climate protection*). Participants’ representations of IG, OG, *actual* and *ideal* SOG were assessed at Time 1 and 3-4 weeks later at Time 2.

The memory assessment procedure closely resembled those of Studies II.1-3 reported in Chapter II, except for the fact that there was less material, because communicators’ statements referred to only one issue. Memory was assessed twice, first at time one and for a second time after 3-4 weeks. In order to keep the procedure as closely as possible to the procedure used in Studies II.1-3, we included a cued recall as well as the relevant recognition measure.

However, as was mentioned above, we were solely interested in participants’ reconstructive memory. Thus, the following analyses are based on the specific assignment of the recognized information only.

Finally, at the end of the experimental session of Time 1, participants’ attitudes towards the OG were assessed. Specifically, they had to indicate their personal opinion towards the OG, specifically with regard to the relevant issue “climate protection” in particular.

Participants were thanked, received the compensation for their participation and were debriefed at the end of the experimental session.

#### *Dependent measures / variables*

The calculations concerning the dependent measures (i.e., the memory bias, *actual* and *ideal* RIP and the OG-attitudes) are based on the previous studies reported in Chapters I and II and are described in more detail below.

*Memory bias*

Participants' reconstructive memory (i.e., source assignment) was calculated similar to Studies II.1-3 (see Chapter II). However, to obtain a general memory bias, the calculation of this measure was modified. We subtracted the number of subgroup-stereotype-inconsistent statement-assignments towards the subgroups from the number of consistent assignments and we also subtracted the number of OG-consistent statement-assignments towards the SOG from the number of IG-consistent assignments. Higher scores reflected a biased source assignment in the direction of consistency, indicating the increased use of the subgroup stereotypes and the IP-schema. Finally, we computed the mean of these two scores to obtain a general score for memory bias.

Two bias scores were computed for each of the two measure time point. Additionally, we averaged the two memory bias scores in order to provide an overall score for the memory bias. The two separate scores (e.g. for Time 1 and 2) and the overall score served as the basis for the following analyses.

*Actual and Ideal Relative Ingroup Prototypicality*

RIP was calculated analogously to the studies reported in Chapter I. Two different RIP scores were calculated. The first score included the perceived *actual* goal position of the SOG (RIP regarding the *actual* SOG) and the second score was based on the *ideal* goal position (RIP regarding the *ideal* SOG). We computed these two scores separately for both measure time points. Preliminary analyses showed that the IG was perceived as more relatively prototypical in case of both RIP scores across both conditions (i.e., minimal vs. maximal goal orientation) and measure time points. We calculated 8 different t-tests and tested the RIP scores against the value 1 (a value of 1 would indicate that both subgroups are perceived as equally prototypical). All values were significantly larger than 1 (see Table 8).

*Table 8: Testing of all RIP-scores against the value of 1*

Testing of all RIP-scores against the value of 1		M	SD	T-value	p (Sign.)
Time 1	Actual RIP	1.81	1.39	2.75	.012
	Ideal RIP	2.03	.76	6.39	.000
Time 2	Actual RIP	1.34	.38	4.25	.000
	Ideal RIP	1.92	.73	5.94	.000

### *Attitudes towards the Outgroup*

At the very end of the first measure time point, participants answered 7 items referring to their attitudes towards the OG by taking into account the OG's position towards the relevant issue "climate protection". The scale was derived from Study I.4 and covered several aspects such as the evaluation of the OG (e.g., "I disapprove of Italy with regard to its goal position."), behavioural intentions towards the OG (e.g., "One should stay away from Italy.") and exclusion intentions (e.g., "Italy should not be part of the European Union."). All items were treated as indicators of a general concept for goal-specific OG-attitudes (Cronbach's  $\alpha = .72$ ) and OG-attitudes responses were averaged.

### **III. 1.1.2. Results**

The results of Study III.1 are presented in three parts. Part I focuses on the relationship between the goal type orientation and *actual* as well as *ideal* RIP (representing the more "explicit" IG projection measures). Part II contains the results regarding the influence of the goal type orientation on the attitudes towards the OG by taking into account RIP. Part II includes the results with regard to the impact of goal type orientation on memory bias (representing a more "indirect" IG projection measure). In Part III, we report how "indirect" and "explicit" IG projection measures as well as OG-attitudes were related to each another.

### **Part I**

#### *Goal type orientation and Relative Ingroup Prototypicality*

We analyzed whether our goal type orientation manipulation had an influence on the more "explicit" prototypicality measures (*actual* and *ideal* RIP). We predicted an effect at Time 1 but no effect at Time 2, because the manipulation was only present at Time 1. A difference between participants in the minimal vs. maximal goal condition at Time 2 — when no manipulation is present — could indicate that the two samples differ substantially and that the effect at Time 1 could be due to this difference and not only to the goal type manipulation. We computed a 2x2x2 repeated measure ANOVA with the within subject factors *time* and *kind of RIP* (actual vs. ideal) and the between subjects factor goal type orientation (minimal vs. maximal goal orientation). The analysis yielded the significant main effect *kind of RIP*,  $F(1, 38) = 14.38, p = .001, \text{partial } \eta^2 = .27$ , indicating that in general *ideal* RIP was higher ( $M = 1.76, SE = .10$ ) than *actual* RIP ( $M = 1.45, SE = .10$ ). In accordance with our hypothesis, an interaction of goal type orientation and time emerged,  $F(1, 38) = 4.47, p = .041, \text{partial } \eta^2 =$

.11. Simple comparisons revealed that the goal type orientation had an impact on *actual* as well as *ideal* RIP, but as expected only at Time 1. As can be seen in Figure 10, participants with a minimal goal orientation indicated a higher *actual* RIP ( $M = 1.81, SE = .22$ ) than participants with a maximal goal orientation ( $M = 1.23, SE = .25$ ) at Time 1, but not at Time 2. Similarly, *ideal* RIP was higher in case of the minimal ( $M = 2.03, SE = .17$ ) compared to the maximal goal condition ( $M = 1.45, SE = .19$ ) at Time 1. No difference emerged at Time 2.

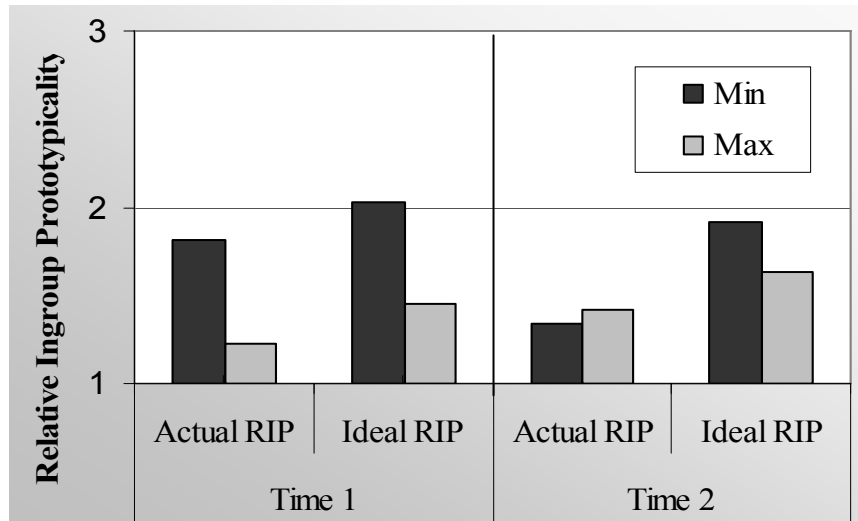


Figure 10: Actual and Ideal RIP as a function of Goal type and Time

#### Goal type orientation and Attitudes towards the OG

A further analysis was computed to investigate whether the manipulated goal type orientation had an influence on the attitudes towards the OG. Therefore, a univariate ANOVA with the between subjects factor goal type orientation (minimal vs. maximal goal orientation) was computed. The analysis yielded a main effect of the goal type orientation,  $F(1, 39) = 3.97, p = .05, \text{partial } \eta^2 = .10$ . As can be seen in Figure 11, participants with a minimal goal orientation indicated more negative attitudes towards the OG ( $M = 3.51, SE = .20$ ) than did participants with a maximal goal orientation ( $M = 2.91, SE = .22$ ). It is likely that the relation between the goal type and the OG-attitudes can be explained by the RIP to a great extent; as the attitudes towards the OG can be predicted by RIP (see also next section) whilst RIP is determined by the goal type orientation.

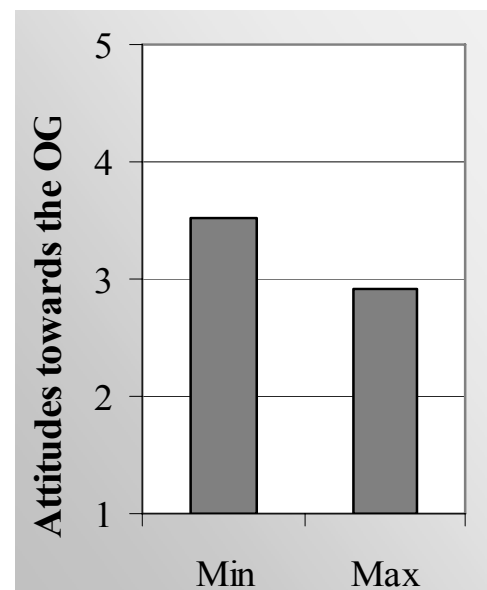


Figure 11: Attitudes towards the OG as a function of Goal type



Thus, we tested whether the relation of the goal type orientation and OG-attitudes is mediated by RIP. Results are reported below (see section *goal type orientation, RIP and OG-attitudes*).

#### *Relative Ingroup Prototypicality and Attitudes towards the OG*

In line with Studies I.2 - 4 reported in Chapter I, it was assumed that both RIP scores (*actual* vs. *ideal*) would be related to the attitudes towards the OG. Additionally, we expected that the *ideal* RIP would be the more important predictor. Correlational analyses — including the variables assessed at Time 1 — showed that both the *actual* as well as the *ideal* RIP were significantly related to the attitudes towards the OG,  $r_{actual} = .325, p = .041$ ;  $r_{ideal} = .538, p < .001$ . In order to test which RIP score is the more crucial predictor of the OG-attitudes, we calculated a multiple regression analysis with both RIP scores as independent variables and attitudes towards the OG as the dependent variable. As in the studies of Chapter I, the analysis showed that the *ideal* RIP is the more important predictor. When including both RIP scores, the *actual* RIP had no predictive potential,  $\beta_{actua} = .039, p = .813$ , whereas the *ideal* RIP was a significant predictor of the attitudes towards the OG,  $\beta_{ideal} = .516, p < .01$ . This pattern of results confirms again that the evaluation of other groups and the behavioural as well as exclusion intentions towards them are more definite, depending on the representation of the *ideal* SOG.

#### *Goal type orientation, Relative Ingroup Prototypicality & Attitudes towards the OG*

The above analysis showed that the goal type orientation had an influence on both RIP scores<sup>5</sup> as well as on the attitudes towards the OG. Moreover, both RIP scores and OG-attitudes were also related to each other. In order to analyse whether the relation between the goal type orientation and OG-attitudes is mediated by the two RIP scores (*actual* as well as *ideal* RIP), two separate two-step regression analyses were conducted.

As dependent variable, we included attitudes towards the OG while as independent variable the goal type condition was included in the first step of the regression analysis. As reported above (see section *Goal type orientation and Relative Ingroup Prototypicality*) the goal type orientation (coded as -1 for the minimal and +1 for the maximal goal condition) had an influence on the OG-attitudes ( $\beta = -.308, p = .05$ ). In the second step we included the *actual* RIP into the regression analysis. The results showed that the regression coefficient of the

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<sup>5</sup> Regression-coefficients for the relation between goal type orientation and RIP:  $\beta_{actuaRIP} = -.276, p_{one-tailed} = .04$ ,  $\beta_{idealRIP} = -.349, p_{one-tailed} = .016$

manipulated goal type orientation decreased substantially,  $\beta = -.236$ ,  $p = .141$  when the *actual* RIP was included indicating a mediation. However, the coefficient of the *actual* RIP was also not significant anymore. Only a tendency remained,  $\beta = .260$ ,  $p = .107$ ,  $partial \eta^2 = .07$ . This finding suggests that the *actual* RIP measure was not strong enough to fully mediate the relation of the goal type orientation and the OG-attitudes.

To analyse whether the *ideal* RIP could be a possible mediator of the relation of goal type and OG-attitudes, we calculated the same two-step regression analysis with *ideal* RIP instead of the *actual* RIP. The analysis revealed that the predictive potential of the manipulated goal type orientation decreased substantially,  $\beta = -.137$ ,  $p = .356$ , when controlling for the *ideal* RIP. Moreover — and in contrast to the *actual* RIP — the *ideal* RIP remained a significant predictor of the attitudes towards the OG,  $\beta = .491$ ,  $p = .002$  (see Figure 12). Following this, the *ideal* RIP appears indeed to mediate the relation between the goal type orientation and the OG-attitudes.

The Sobel test also provides support for this assumption,  $Z = -2.031$ ,  $p = .042$ . Following this, the fact that participants with a minimal goal orientation indicate more negative OG-attitudes can be explained by the heightened RIP in this case (see Figure 12).

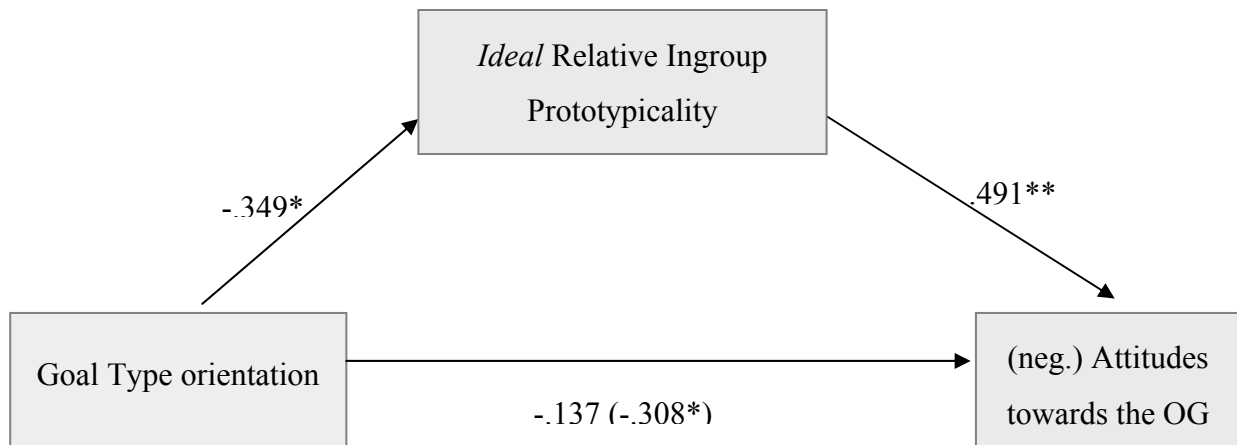


Figure 12: Attitudes towards the OG as a function of Goal Type orientation and Ideal RIP

## **Part II**

### *Goal type orientation and Memory bias*

It was expected that the goal type orientation (minimal vs. maximal goal orientation) would have an influence on the degree in which participants' memory would be biased. We calculated a 2x2 repeated-measures ANOVA with the within subject factor memory bias (bias at Time 1 vs. bias at Time 2) and the between subjects factor goal type orientation (minimal vs. maximal orientation). The analysis yielded a significant main effect of goal orientation,  $F(1, 38) = 7.39, p = .010, \text{partial } \eta^2 = .16$ , indicating that the memory bias was more pronounced in case of participants with a minimal goal orientation ( $M = 1.00, SE = .41$ ) compared to participants with a maximal goal orientation ( $M = -.67, SE = .45$ ). Following this, the tendency to assign the recognized information (e.g. statements) in a biased way — using subgroup-stereotypes and the IP-schema as cues — was particularly strong in the minimal goal condition. Additionally, a detailed analysis showed that the effect of the goal type orientation on memory was true for both measure time points; the effect was slightly stronger in case of Time 2,  $F_{\text{time}2}(1, 38) = 6.17, p = .017, \text{partial } \eta^2 = .14$ , than for Time 1,  $F_{\text{time}1}(1, 38) = 3.53, p = .068, \text{partial } \eta^2 = .09$ , indicating that the goal type manipulation at Time 1 — when information was presented — was successful and that information processing was influenced enough to entail a biased memory across both measure time points.

Since the memory bias measure is based on the assumptions of the IPM and individuals' representations of the subgroups and the SOG are included, one might consider the memory bias measure as an “indirect” measurement for RIP. Therefore, the present findings are an indirect confirmation of the influence of the goal type orientation on ingroup projection, which is in line with the direct effect of the manipulated goal type orientation on the more “explicit” RIP scores tested above (see section *Goal type orientation and Relative Ingroup Prototypicality*).

## **Part III:**

### *Memory bias and Relative Ingroup Prototypicality*

As we assumed the memory bias to be an indirect measure of RIP, we expected that this measure should be positively related to the more “explicit” measures of RIP. In order to facilitate the analysis, we averaged the two measures from Time 1 and 2 to obtain an overall measure of memory bias (both memory bias measures were significantly correlated,  $r = .383, p = .015$ ).

As predicted, correlational analyses<sup>6</sup> revealed that memory bias was related to both the *actual* and the *ideal* RIP,  $r_{actual} = .220$ ,  $p_{one-tailed} = .081$ ;  $r_{ideal} = .358$ ,  $p_{one-tailed} = .010$ . Those participants with stronger memory bias also indicated higher *actual* as well as *ideal* RIP. Following this, it appears plausible to measure or predict RIP indirectly via memory assessment, taking into account that the more “explicit” RIP scores and the memory bias were related. However, considering the two correlational coefficients in more detail, it seems that the memory bias is more likely to be a measure of the *ideal* than the *actual* RIP. As described in Chapter I it is possible that the *actual* RIP is more influenced by reality constraints, whereas in case of the *ideal* RIP the representation of an ideal SOG provides a certain freedom to project IG features. Therefore, *ideal* RIP is more likely to be affected by participants’ motivation to project. Taking into account that encoding and memory processes are predominantly unconscious and thus less influenced by reality constraints, it seems likely that they are influenced by perceivers’ motivation. Following this, it appears reasonable to assume that the memory bias rather represents the ideal than actual RIP.

#### *Memory bias, Relative Ingroup Prototypicality, and Attitudes towards the OG*

Additionally, it was hypothesized that if the memory bias is indeed an indirect measure for RIP this bias also should be related to the attitudes towards the OG – like it is the case for the more “explicit” RIP measures. Hence, a simple regression analysis was carried out to investigate whether the memory bias is a significant predictor of the attitudes towards the OG. Indeed, results showed that a stronger memory bias was related to more negative OG-attitudes as was expected ( $\beta = .270$ ,  $p_{one-tailed} = .046$ ).

Moreover, we were interested whether the memory bias or the more “explicit” measure of RIP would be the more important predictor of the attitudes towards the OG. Thus, we calculated a multiple regression analysis with OG-attitudes as the dependent variable and introduced the memory bias and the *actual* as well as the *ideal* RIP as the relevant independent variables. The analysis showed that the predictive potential of the memory bias decreased substantially, when controlling for the “explicit” RIP measures (i.e. *actual* and *ideal* RIP ( $\beta = .088$ ,  $p_{one-tailed} = .559$ )). The *actual* RIP had no predictive potential,  $\beta_{actual} = .037$ ,  $p_{one-tailed} = .828$  whereas the *ideal* RIP remained the only significant predictor of the attitudes towards the OG ( $\beta_{ideal} = .486$ ,  $p_{one-tailed} = .009$ ). In particular, the *ideal* RIP mediated the relation between memory bias and OG-attitudes; the Sobel test confirms this assumption,  $Z = 2.041$ ,  $p = .041$ .

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<sup>6</sup> Since we had clearly directional predictions, the above stated hypotheses were tested one-tailed.

### ***III. 1.1.3. Discussion***

The central aim of the present study was to bring together the two lines of research reported in Chapters I and II. The results provide support for both lines of research. Moreover, the combination of the research on ingroup projection and goal types with the research on ingroup projection and memory offered an essential extension of the IPM. This will be discussed below.

First of all, using the same goal type manipulation as reported in Chapter I, it could be shown that the goal type orientation had an influence both on the *actual* and the *ideal* RIP. In particular, participants with a minimal goal orientation perceived the IG goal (i.e., climate protection) as more relatively prototypical for the *actual* as well as for the *ideal* SOG than did participants with the maximal goal orientation. However, because the manipulation was only present at Time 1, the goal type effect was, as expected, limited to the first measure time point.

The manipulated goal type orientation did also affect the attitudes towards the OG.

Participants with a minimal goal orientation indicated more negative attitudes compared to participants having a maximal goal orientation. Furthermore, the results provide evidence that the *actual* as well as the *ideal* RIP were predictors of the attitudes towards the OG. As in the studies reported in Chapter I, a comparison of both RIP scores showed that the *ideal* RIP was the better predictor of OG-attitudes.

Considering the relation of the goal type orientation and the OG-attitudes in more detail, the “explicit” measures of RIP apparently play a central role. The findings indicate that the relationship between the goal type orientation and the attitudes towards the OG is caused by the RIP. However, while the *actual* RIP only has a limited potential as a mediator, the *ideal* RIP clearly provides the potential to mediate the relationship between goal type orientation and the OG-attitudes. In particular, the results suggest that a minimal goal orientation leads to more negative attitudes towards the OG because in this case, the *ideal* RIP is especially high.

Secondly, aside to the more “explicit” measures of ingroup projection (e.g. *actual* and *ideal* RIP) the manipulated goal type orientation did also have an impact on participants’ memory — represented by different degrees of a memory bias, which was calculated based on the assumptions of the IPM. Participants with a minimal goal orientation showed a stronger memory bias compared to participants with a maximal goal orientation. Thus, the goal type orientation had an effect on both the more “explicit” RIP measures as well as on participants’

memory bias representing a more “indirect” RIP measure. These findings indicate that both kinds of RIP can be considered as measures of ingroup projection.

Thirdly, the results provide evidence for the assumption that RIP can be measured in an explicit and also in an indirect way. The results showed that the memory bias and *actual* as well as *ideal* RIP were significantly related. Specifically, participants with a stronger memory bias perceived the IG as more relatively prototypical for the *actual* SOG and also for the *ideal* SOG. Or vice versa the more participants perceived the IG to be relatively prototypical the stronger was their memory bias.

In terms of the relation of RIP and attitudes towards the OG it was often shown, both in previous studies as well as in the present study that the “explicit” RIP measures can predict OG-attitudes. Similarly, the results show that the indirect RIP measure — the memory bias — was also a predictor of the OG-attitudes. Participants with a stronger memory bias indicated more negative attitudes towards the OG.

Finally, we investigated which kind of RIP measure has more predictive potential regarding the attitudes towards the OG. According to the results, the most important predictor appears to be the *ideal* RIP. In particular, the findings suggest that the relation of memory bias and OG-attitudes is mediated by the *ideal* RIP. Thus, participants with a stronger memory bias showed more negative OG-attitudes, but both the strong memory bias as well as the negative OG-attitudes are caused by the fact that the IG is perceived as especially prototypical for the *ideal* SOG.

### *Summary and Implications for Future Research*

Taken all the above findings into account, we conclude that the combination of the goal type research and the research regarding memory and ingroup projection was successful and the findings shed light on the processes and conditions of ingroup projection.

One major point is the extension of the IPM with regard to the assessment of the ingroup projection process. In previous research ingroup projection was usually measured by assessing individuals' perception of RIP in a rather direct way. The present work now provides evidence that ingroup projection can also be measured more indirectly or so to say "on-line" considering individuals' recollection of previously presented information.

According to the findings, both — the "explicit" and the more "indirect" measures of RIP — were affected in the same way by the manipulated goal type orientation. Participants with a minimal goal orientation compared to those with a maximal goal orientation perceived the ingroup goal as more relatively prototypical and showed a stronger memory bias in the direction of ingroup projection (i.e., use of the IP-schema). Moreover, both kinds of measures were significant predictors of the attitudes towards the OG. Following this, it is possible to derive/infer individuals attitudes from the more indirect (i.e., memory) measure, which might be very useful especially in situations when social desirability is increased.

Moreover, the findings suggest that individuals' representation of the *ideal* SOG determining the *ideal* RIP is the most crucial predictor of OG-attitudes. First, because it offers the most clear cut prediction of the attitudes towards the OG and secondly, it apparently determines the degree in which individuals' memory is biased and therefore explains the relation of the memory bias and OG-attitudes. We already elaborated on the role of the ideal compared to the actual representation of a relevant SOG in Chapter I. The present study also suggests that the RIP regarding the *ideal* SOG represents a clearer measure of ingroup projection, assuming that the *ideal* SOG provides a certain freedom to project IG features and is less strongly affected by reality constraints. However, it might be that there would be a stronger overlap between *actual* and *ideal* SOG when group members are highly identified with the (actual) SOG. In this case the *actual* SOG position (e.g. in terms of group goals) would already be perceived as the most ideal position. Thus, future research should consider the degree of identification with regard to the differential representations of the *actual* vs. *ideal* SOG.

Another relevant issue for future research appears to be the *complexity* of the SOG. According to previous research on ingroup projection, group members perceive a relevant OG as less

deviating (i.e., as equally prototypical for the SOG) when the SOG is represented as more complex/diverse. This in turn leads to a more positive evaluation of the OG compared to when the SOG is represented in a less complex way (Waldzus et al., 2003). However, recent findings suggest that complexity can also result in opposite effects (see Reese, Jonas & Steffens, 2008; Machunsky, Meiser, & Mummendey, 2007), which could be due to processes of identity threat, caused by the fact that the IG is not any longer providing the status quo. By now, the role of complexity is not clear and many questions have to be answered — for example: Which conditions can explain how complexity is related to ingroup projection? Does the evaluation of the complexity play a role with regard to ingroup projection and OG-attitudes? Is ingroup projection limited when group members indicate that the SOG should be more complex? How is the goal type linked to the representation of a complex vs. non-complex SOG? — in particular, are minimal IG goals perceived as prototypical regardless of the complexity of the SOG? Is the perception of a complex SOG related to individuals' memory (i.e., use of the IP-schema for the recollection of group information)? Is it possible to influence individuals' memory by manipulating the complexity of the SOG? And finally, what are the implications from the above questions (and hopefully answers) for the research on and improvement of attitudes towards OGs?



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## Summary

The present dissertation concerns the examination and extension of the Ingroup Projection Model (Mummendey & Wenzel, 1999) that attempts to explain intergroup discrimination. According to the Ingroup Projection Model (IPM), groups are compared with reference to an inclusive superordinate group and group members transfer, under certain conditions, the features of their ingroup (IG) onto the prototype of this superordinate group (SOG). As a consequence of this ‘ingroup projection’-process, the own group becomes relatively prototypical and other groups (i.e. outgroups; OGs) are perceived as less prototypical, which legitimizes a less positive evaluation and treatment of OG members.

The current research comprises three steps. The first issue of interest examines the proposition that specific ingroup features entail different degrees of ingroup projection. Extending previous findings, it is argued that ingroup projection differs regarding two specific kinds of group goals. The relevant goal types are *minimal goals*, implying an either-or evaluation, and *maximal goals*, which imply graded evaluations (Brendl & Higgins, 1996). Assuming that minimal goals are particularly important for the viability and stability of the group because of their structural implications, it was hypothesized that these kinds of ingroup goals entail more ingroup projection. Thus, minimal goals should be perceived as particularly prototypical, which consequentially has an impact on the attitudes towards the relevant OG.

The first part of the present dissertation provides empirical support for these propositions. Across different intergroup contexts and on behalf of two quasi-experimental and two experimental studies, the findings yield evidence that a minimal goal orientation is indeed associated with more relative ingroup prototypicality (RIP). Moreover, the more relatively prototypical the ingroup was perceived to be, the more negative were the attitudes towards the outgroup. It was additionally found that ingroup projection takes also place in terms of the *ideal* representation of the SOG, leading to a similar — and clearer — pattern of results as in case of the *actual* SOG representation. However, even though the hypotheses were confirmed, strictly speaking one might argue that these findings do not demonstrate ingroup projection, because ingroup projection is by definition a process and the results only refer to the consequences of this process, which is the perceived relative ingroup prototypicality. The fact that previous research on the IPM seems to lack evidence regarding

the dynamic nature of ingroup projection was the starting point for the research presented in the second part of the present dissertation.

The second concern of the current work tackles the proposition that ingroup projection functions like a cognitive schema and therefore is expected to have an impact on information processing and memory. Assuming that a valid confirmation of the process-nature of ingroup projection is only possible by demonstrating that there is an alteration before and after projection, we approached the predicted projection process on behalf of a memory design. In particular, we applied a modified “Who-said-What” paradigm which was derived from previous research on categorization and person memory (Taylor, Fiske, Etcoff, & Ruderman, 1978). Within the basic experimental procedure participants were presented with information associated with IG, OG and SOG. Afterwards they were asked to recall the information, followed by a recognition task in which they had to assign the recognized information to the three groups. Memory was assessed at one point and 3-4 weeks later for a second time in order to capture a larger time interval, enabling an estimation of the stability of the predicted effects.

The findings of the three studies presented in the second part of this dissertation support the assumption that ingroup projection appears to be a cognitive schema (i.e. the IP-schema) that has the potential to influence individuals’ memory. Across different intergroup contexts and by applying different modalities of material presentation the findings confirm that recall and recognition performance as well as the assignment of information to IG, OG and the SOG is influenced by the stereotypical knowledge and the IP-scheme. For example it was consistently shown across both measure time points, that information which is consistent with the IG-stereotype was assigned more preferentially to the SOG compared to information consistent with the OG-stereotype. Furthermore, the results provide evidence that the cognitive ability and motivational aspects affect the strength of the effects. Altogether the findings reported in part two provide substantial support for the IPM confirming that the process of ingroup projection can be measured indirectly on behalf of a memory approach.

The third part of the doctoral thesis presents the integration of the first and second part of this dissertation. In line with the findings reported in part one and two, it was expected that a minimal goal orientation would entail more ingroup projection, resulting in the perception of a particularly high relative ingroup prototypicality and a stronger impact of the IP-schema on individuals’ memory. The findings of the study presented in part three confirm that

individuals having a minimal goal orientation do indeed perceive their IG as more relatively prototypical for the *actual* as well as for the *ideal* SOG and also show a stronger memory bias than in case of a maximal goal orientation. Moreover, the findings indicate that the “explicit” measures of relative prototypicality (*actual* and *ideal* RIP) and the more “indirect” memory bias are related to each other. In particular, perception of an “explicit” higher RIP appears to go along with a more pronounced influence of ingroup projection on memory.

In addition and with regard to the attitudes towards the OG, both the explicit and the indirect measures of RIP are significant predictors of the OG attitudes. The evaluation of the OG and the behavioural intentions towards the OG are apparently more negative in case of a high (explicit as well as indirect) RIP. Detailed analyses suggest that the most relevant predictor of the attitudes towards the OG is the ideal RIP. Thus, the more the IG is perceived as being prototypical for an *ideal* SOG the more negative are the OG attitudes.

The findings of the final study also indicate that the goal type orientation has an impact on the attitudes towards the OG. Specifically, according to the results it is highly probable that a minimal goal orientation leads to more negative OG attitudes and that this relation can be explained by the higher (“explicit”) RIP in case of this specific goal orientation.

In sum this doctoral thesis contributes to the understanding of intergroup relations by providing substantial support for the Ingroup Projection Model (Mummendey & Wenzel, 1999) and by yielding evidence for the suggested extensions of the model. The herein reported findings support the assumption that specific kinds of IG goals entail particularly strong ingroup projection, which can be verified by explicit as well as indirect measures. Moreover, we present a new approach to assess ingroup projection applying a memory design. This memory approach offered the opportunity of a more outright confirmation of the dynamic nature of ingroup projection. The successful integration of both the goal type research and the memory based hypotheses shed new light on the cognitive and motivational conditions that determine intergroup relations and social discrimination.

## Zusammenfassung

Die vorliegende Dissertation befasst sich mit der Überprüfung und Erweiterung des Eigengruppenprojektionsmodells (Mummendey & Wenzel, 1999) das auf die Erklärung von Intergruppendifferenzierung abzielt. Laut dem Eigengruppenprojektionsmodell finden Gruppenvergleiche auf der Basis einer inklusiven, übergeordneten Gruppe statt, wobei die Gruppenmitglieder unter bestimmten Bedingungen die Merkmale ihrer Eigengruppe (EG) auf den Prototypen dieser übergeordneten Gruppe (ÜG) übertragen. Als Konsequenz dieser ‚Eigengruppen-Projektion‘ wird die eigene Gruppe dann als relativ prototypisch wahrgenommen, während andere Fremdgruppen (FG) als weniger prototypisch beurteilt werden. Dies hat wiederum zur Folge, dass eine weniger positive Bewertung und Behandlung dieser Gruppen als legitim/gerechtfertigt erachtet wird.

Die präsentierte Forschung umfasst drei Schritte. Der erste Teil beschäftigt sich mit der Fragestellung inwieweit spezifische Eigengruppenmerkmale in verschiedenem Maße ‚Eigengruppenprojektion‘ initiieren. Als Erweiterung bisheriger Befunde wird vorgeschlagen, dass das Ausmaß an Eigengruppenprojektion sich im Hinblick auf zwei verschiedene Arten von Gruppen-Zielen unterscheidet. Die Zielarten, die dabei im Fokus stehen, sind erstens *Minimalziele* – welche durch eine alles-oder-nichts Struktur charakterisiert sind und demzufolge eine dichotom gestufte Bewertung implizieren - und zweitens *Maximalziele* – die durch eine graduelle Struktur gekennzeichnet sind und folglich mit einer eben solchen graduell-abgestuften Bewertung einhergehen (Brendl & Higgins, 1996). Da wir davon ausgehen, dass Minimalziele aufgrund ihrer Struktur von besonderer Bedeutung für das Funktionieren und die Stabilität einer Gruppe sind, wird angenommen, dass diese Zielart zu mehr ‚Eigengruppenprojektion‘ führt. Minimalziele sollten also als besonders prototypisch angesehen werden und damit auch einen Einfluss auf die Einstellung gegenüber Fremdgruppen haben.

Im ersten Teil der vorliegenden Dissertation werden unterstützende, empirische Befunde berichtet. Über verschiedene Intergruppenkontexte hinweg konnte anhand von zwei quasi-experimentellen und zwei experimentellen Studien nachgewiesen werden, dass eine Minimalzielorientierung tatsächlich eine höhere, wahrgenommene relative Prototypikalität der Eigengruppe (reEP) zur Folge hat. Darüber hinaus zeigen die Ergebnisse, dass eine höhere reEP mit einer negativeren Einstellung gegenüber der Fremdgruppe assoziiert ist.

Innerhalb der Studien vom ersten Teil der vorliegenden Arbeit wurde außerdem erstmalig nachgewiesen, dass Eigengruppenprojektion ebenfalls im Fall der „Idealrepräsentation“ der ÜG stattfindet. Es zeigten sich Effekte, die analog zur Projektion auf die „Aktualrepräsentation“ der ÜG sind, wobei im Fall der Ideal-ÜG offenbar ein klareres Ergebnismuster aufzutreten scheint. Es wird vorgeschlagen, dass dies auf eine stärkere Unabhängigkeit von “reality constraints” im Fall der Idealpräsentation zurückzuführen ist.

Betrachtet man die bisherige Forschung zu Eigengruppenprojektion ganz genau, muss man feststellen, dass die Dynamik des Projektionsprozesses bisher eigentlich nie direkt untersucht und nachgewiesen wurde. Obwohl „Eigengruppenprojektion“ im Grunde als Prozess definiert ist und somit eine experimentelle Herangehensweise notwendig wäre, die den Zustand vor und nach der Projektion betrachtet, erfolgte der Nachweis von „Eigengruppenprojektion“ bisher fast ausschließlich anhand des Aufzeigens von relEP was zwar die Konsequenz der Projektion nicht aber den Prozess beschreibt. Auf der Basis dieser Überlegungen begründet sich der zweite Teil der Dissertation.

Im Fokus von Teil steht die Fragestellung inwieweit „Eigengruppenprojektion“ das Potential hat als kognitives Schema zu fungieren und damit die Verarbeitung und das Erinnern von Information zu beeinflussen. Diese Annahme wurde anhand eines Gedächtnisdesigns geprüft, da die Erfassung von Gedächtnisparametern ermöglicht Veränderungen zwischen dem Zeitpunkt vor und nach der Projektion nachzuweisen. Innerhalb der drei präsentierten Studien wurde ein modifiziertes „Who-said-What” Paradigma verwendet das auf der Basis früherer Forschung zu Kategorisierung und dem Personengedächtnis entwickelt wurde (Taylor, Fiske, Etcoff, & Ruderman, 1978). Den Studienteilnehmern wurden Informationen zu EG, FG und ÜG präsentiert, die dann später in einer ‚Cued Recall’-abfrage wieder erinnert werden sollten und darüber hinaus innerhalb einer Rekognitionsaufgabe wieder erkannt und zu den drei Gruppen zugeordnet werden sollten. Die Gedächtnisleistung wurde zweimal erhoben, zum ersten Zeitpunkt unmittelbar nach der Präsentation und ein zweites Mal 3-4 Wochen später. Die Verwendung dieses größeren Zeitintervalls ermöglicht es validere Schlussfolgerungen über die Stabilität der hypothetisierten Effekte zu ziehen. Die Ergebnisse der drei experimentellen Studien bestätigen, dass Eigengruppenprojektion einen substantiellen Einfluss auf das Gedächtnis hat und damit der Anwendung eines kognitiven Schemas gleich kommt. Über verschiedene Intergruppenkontexte hinweg und unter Anwendung verschiedener Modalitäten zur Stimuluspräsentation, zeigen die Befunde, dass sowohl ‚Cued-Recall’ als auch Rekognition und die Zuordnung der Informationen zu den Gruppen

(Rekonstruktionsgedächtnis) von den Subgruppen-Stereotypen und dem Eigengruppenprojektionsschema beeinflusst werden. So zeigt sich beispielsweise, dass über beide Messzeitpunkte hinweg bevorzugt diejenigen Informationen der ÜG zugeschrieben werden, die konsistent mit dem EG-stereotyp sind; vergleichsweise weniger FG-konsistente Informationszuschreibungen finden statt. Darüber hinaus zeigen die Ergebnisse, dass die Stärke der Gedächtniseffekte sowohl von kognitiven als auch von motivationalen Faktoren abhängig ist. Insgesamt kann auf der Basis der Befunde, die im zweiten Teil der Dissertation berichtet werden, davon ausgegangen werden, dass ‚Eigengruppenprojektion‘ auch indirekt (über Gedächtnismessungen) als Prozess erfassbar ist, was zugleich eine weitere Bestätigung als auch eine Erweiterung des Eigengruppenprojektionsmodells darstellt.

Der dritte Teil der vorliegenden Arbeit widmet sich der Integration der Befunde aus Teil 1 und Teil 2. Ausgehend von den Ergebnissen der ersten beiden Teile, wurde erwartet, dass eine *Minimalzielorientierung* zu stärkerer ‚Eigengruppenprojektion‘ führt, was sich sowohl in der expliziten Messung der wahrgenommenen, stärkeren reLEP zeigen müsste als auch indirekt anhand von stärkeren Gedächtniseffekten. Die Ergebnisse der in Teil drei präsentierten Studie bestätigen diese Hypothese: Die Teilnehmer mit einer Minimalzielorientierung (im Vergleich zu Maximalzielorientierten) nahmen ihre Gruppe tatsächlich als relativ prototypischer wahr, sowohl im Fall der *aktuellen* ÜG als auch im Fall der *idealen* ÜG. Darüber hinaus zeigte sich auch innerhalb der Gedächtnisleistungen dieser Teilnehmer eine stärkere Verzerrung in Richtung Eigengruppenprojektion; d.h. das Eigengruppenprojektionsschema hatte einen stärkeren Einfluss auf das Gedächtnis als bei maximalzielorientierten Teilnehmern. Weiterhin zeigen die Befunde, dass die expliziten Maße (*aktuelle* vs. *ideale* reLEP) und das indirekte Gedächtnismaß miteinander im Zusammenhang stehen; mehr reLEP ist assoziiert mit einer stärkeren Gedächtnisverzerrung.

Zusätzlich konnte gezeigt werden, dass die Vorhersage der Einstellungen gegenüber der Fremdgruppe anhand von beiden Arten von Eigengruppenprojektions-Maßen möglich ist. Die Fremdgruppenbeurteilung und das Verhalten dieser gegenüber ist negativer im Falle einer hohen (explizit und indirekt gemessenen) reLEP. Die detaillierte Analyse der Daten führte zu dem Schluss, dass offenbar die *ideal* reLEP der beste Prädiktor für die Vorhersage von Fremdgruppeneinstellungen ist: Demnach besteht zwischen der Wahrnehmung der EG als besonders prototypisch für die ideale ÜG und einer negativen Einstellungen gegenüber einer FG ein besonders starker Zusammenhang.

Weiterhin zeigen die Ergebnisse der letzten Studie, dass die Zieltyporientierung einen Einfluss auf die Einstellung gegenüber der FG hat. Den Befunden zufolge kann die negativere Einstellung gegenüber einer FG im Falle einer Minimalzielorientierung anhand der erhöhten (expliziten) relEP erklärt werden.

Insgesamt trägt die vorliegende Dissertation zum Verständnis von Intergruppenbeziehungen bei, da diese Arbeit eine sowohl eine besonders valide Bestätigung als auch eine Erweiterung des Eigengruppenprojektionsmodells darstellt. Die Befunde unterstützen die Annahme, dass im Fall einer speziellen Art von Zielrepräsentationen — konkret, von Minimalzielen — eine besonders starke Eigengruppenprojektion auftritt; was erfolgreich anhand von expliziten und indirekten Maßen nachgewiesen werden konnte. Darüber hinaus zeigt die Arbeit eine neue Herangehensweise für die Erforschung von Eigengruppenprojektion auf. Die Untersuchung des Eigengruppenprojektionsprozesses, basierend auf der Erfassung von Gedächtniseffekten ermöglicht eine umfassendere Abklärung der dynamischen Natur des Eigengruppenprojektionsmodells (Mummendey & Wenzel, 1999). Die erfolgreiche Integration der Zieltypforschung und der gedächtnisbasierte Zugang zur Erfassung von Eigengruppenprojektion führten zusammengekommen zu neuen Erkenntnissen bezüglich der kognitiven und motivationalen Determinanten von Intergruppenbeziehungen und sozialer Diskriminierung.

## **Ehrenwörtliche Erklärung**

Ich erkläre hiermit, dass mir die Promotionsordnung der Fakultät für Sozial- und Verhaltenswissenschaften bekannt ist.

Ferner erkläre ich, dass ich die vorliegende Arbeit selbst und ohne unzulässige Hilfe Dritter angefertigt habe. Alle von mir benutzten Hilfsmittel, persönliche Mitteilungen und Quellen sind in der Arbeit angegeben. Bei der Durchführung der empirischen Studien haben mir folgende Personen in der jeweils beschriebenen Weise geholfen:

1. Bei den empirischen Studien I. 3 und I. 4 und Studie III.1 haben Tina Tremml, Conni Just und Marisa Przyrembel als studentische Hilfskräfte bei der Rekrutierung von Versuchspersonen und der Erhebung der Daten geholfen.
2. Bei den Studien II.2 und II.3 haben Nils Kupfer, Angelika Bühler, Judith Berles, Volkan Yildirim, Nicole Hoffmann, Juliane Seiler, Anika Matthes, Claudia Weise, Sebastian Zietz and Flora Mehrabi bei der Versuchspersonen-Rekrutierung und der Datenerhebung geholfen.

Weitere Personen waren an der inhaltlich-materiellen Erstellung der Arbeit nicht beteiligt. Insbesondere habe ich hierfür nicht die Hilfe eines Promotionsberaters in Anspruch genommen und Dritte haben weder unmittelbar noch mittelbar geldwerte Leistungen von mir für Arbeiten erhalten, die im Zusammenhang mit dem Inhalt der vorgelegten Dissertation stehen.

Die Arbeit wurde weder im In- noch im Ausland in gleicher oder ähnlicher Form einer anderen Prüfungsbehörde vorgelegt. Weder früher noch gegenwärtig habe ich an einer anderen Hochschule eine Dissertation eingereicht.

Ich versichere, dass ich nach bestem Wissen die reine Wahrheit gesagt und nichts verschwiegen habe.

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Ort, Datum Unterschrift



**.....Danke!**

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